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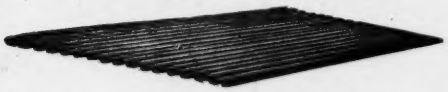

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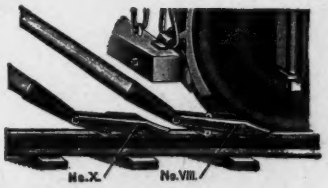

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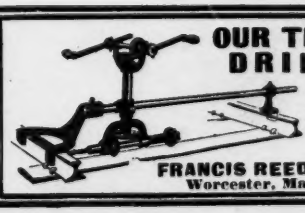

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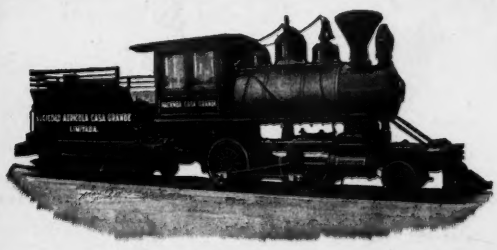

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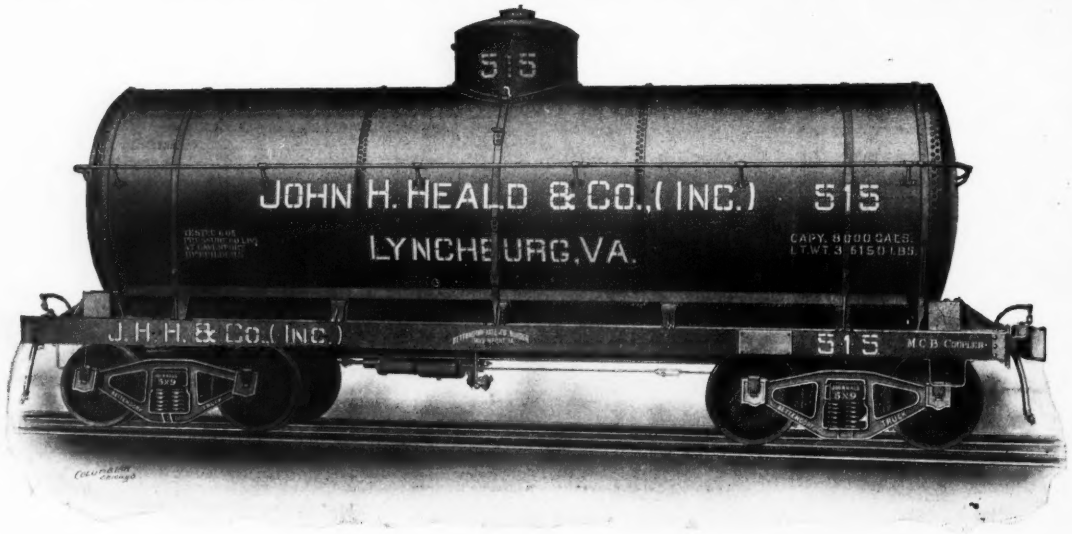

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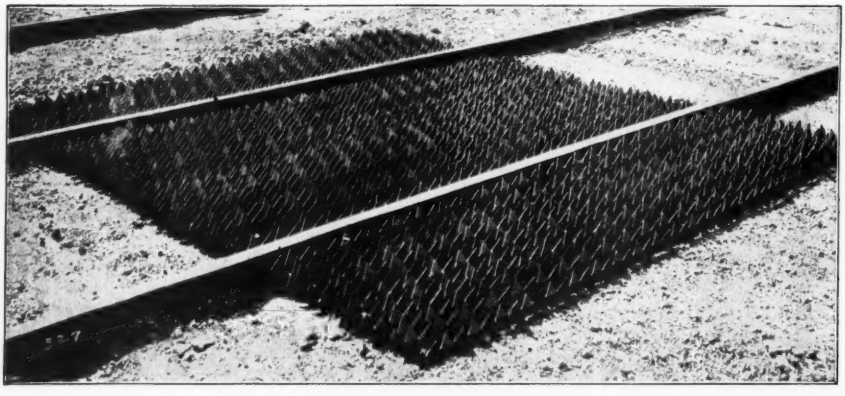

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Two Issues
MARCH—APRIL

¶ The March issue of Railway Engineering and Maintenance of Way will contain a description of the various lines of machinery and appliances which have to do with railroad construction and maintenance. These articles will be fully illustrated, classified and arranged following the order and numbers of the standing committees of the American Railway Engineering and Maintenance of Way Association.

¶ The April issue will contain a full report of the proceedings of the Association and all of the news concerning the convention. Its publication will follow the closing of the convention and it will reach the official after he has returned home. Coming at such a time it will be of the greatest interest to him because he has the time and inclination to go over carefully the various reports and discussions, and to refresh his memory if he attended, or if not to inform himself fully of all that was done.

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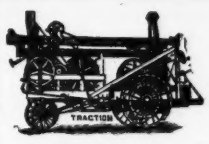

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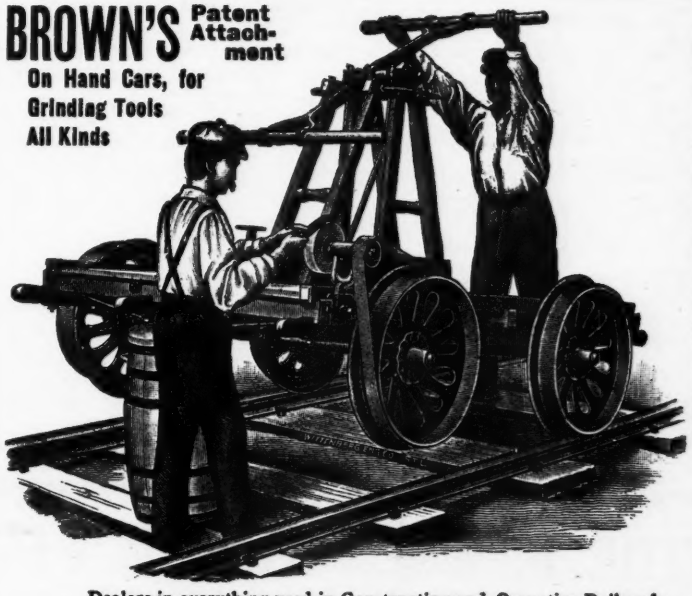

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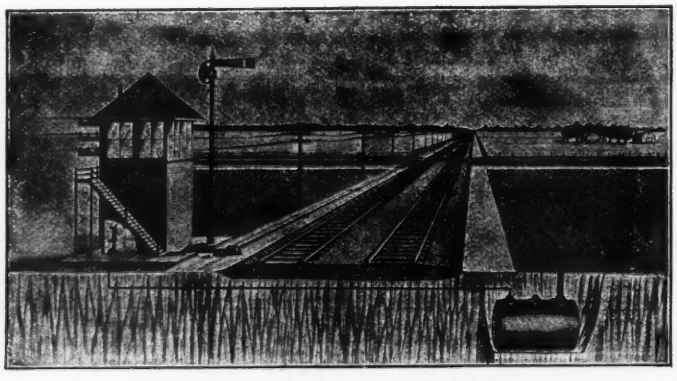

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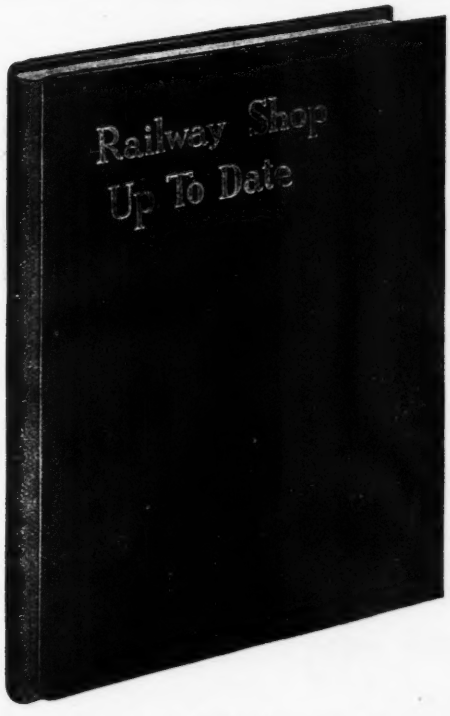

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Railway Engineering
and Maintenance of Way

Mr. Lincoln Bush, chief engineer of the Delaware, Lackawanna & Western, has announced that after Jan. 1 he will engage in private practice, as consulting engineer, with offices in the Metropolitan Life building, New York City.

Mr. John S. Considine, track foreman of the Pennsylvania Railroad, has been promoted to the position of assistant supervisor.

Mr. W. F. Strouse, assistant engineer of the Washington Terminal Co., has removed his office from the Union station, Washington, to the Baltimore & Ohio building, Baltimore, Md.

Mr. J. P. Charlton has been appointed assistant engineer of the Schuylkill division of the Pennsylvania vice Mr. R. V. Morrissey, who was recently promoted to the position of superintendent of the newly created Hudson division.

Mr. L. T. Gibbs, electrical engineer of the Baltimore & Ohio, with headquarters at Baltimore, Md., is dead. Mr. Gibbs has held the position of electrical engineer since Sept. 1, 1907.

Mr. A. D. Page, assistant engineer of the Chicago, Rock Island & Pacific, has resigned.

Mr. P. A. McCarthy, chief engineer of the Groveton. Lufkin & Northern, has resigned to accept a similar position with the San Diego, El Paso & St. Louis, with headquarters at El Paso, Tex. This company is to build about 200 miles of standard gauge road.

Mr. William G. Atwood, formerly in the engineering department of the Lake Shore & Michigan Southern, has been appointed chief engineer of the Lake Erie & Western, succeeding Mr. Geo. P. Smith, who recently resigned to accept a similar position with the Cleveland, Cincinnati, Chicago & St. Louis.

Mr. William C. Ambrose, one of the best known civil engineers in California, and for a number of years connected with the Southern Pacific, died at his home in Berkeley, Cal., on Jan. 3. Mr. Ambrose was 51 years old.

Mr. E. Ben Carter, for many years general roadmaster of the Florida East Coast Ry., but who resigned in 1907 to engage in private business, informs us that he is "on agin." An official circular states that Mr. Carter has been appointed superintendent of maintenance of way of the Florida East Coast Ry., with headquarters at St. Augustine, Fla.

Mr. A. Singer has been appointed foreman of the car department of the New Orleans & Northwestern with office at Ferriday, La., vice Mr. J. Shell, assigned to other duties.

Mr. Willard Guild, heretofore engineer in charge of construction on the Atchison, Topeka & Santa Fe double track work in Missouri, has been made division engineer of the Illinois division of the above road with headquarters at Chillicothe, Ill., succeeding Mr. Charles Griggs. who has been transferred to Topeka, Kan., to take charge of the Eastern division. Mr. Griggs succeeds Mr. George J. Graves, who has been transferred to Dodge City to take charge of the Central Grand division.

Mr. J. A. Prickett, acting right-of-way agent of the Missouri Pacific, with office at St. Louis, Mo., has been appointed right-of-way agent.

Mr. R. D. Parker, resident engineer of the Houston & Texas Central, has been appointed chief engineer of the Texas Railroad Commission, succeeding Mr. R. A. Thompson, resigned.

Mr. George P. Smith, chief engineer of the Lake Erie & Western, has been appointed chief engineer of the Cleveland, Cincinnati, Chicago & St. Louis, succeeding William M. Duane, who resigned some months ago.

Mr. J. M. Hood, Jr., engineer of way of the United Railways & Electric, of Baltimore, Md., has been appointed chief engineer, succeeding Mr. Charles O. Vandevanter, resigned.

Mr. A. L. Kendall, general foreman of car shops of Louis, Iron Mountain & Southern at Van Buren, Ark., has been appointed division engineer of the Omaha division of the Missouri Pacific, with office at Kansas City, Mo. Mr. C. D. Painter, roadmaster of the Missouri Pacific at Osawatomie, Kan., succeeds Mr. Emerson.

Mr. P. G. Burns has been appointed chief engineer of the Stamford & Northwestern, with office at Stamford, Tex.

Mr. L. W. Stubbs has been appointed resident engineer of the Houston & Texas Central, at Ennis, Tex., succeeding Mr. R. D. Parker, resigned.

Mr. W. A. Reid, roadmaster of the Gulf, Colorado & Santa Fe, at Temple, Tex., has been transferred to Paul's Valley, Okla. Mr. M. Curran succeeds Mr. Reid.

Mr. W. C. Taylor, assistant chief engineer of the Spokane, Portland & Seattle, has been appointed engineer of maintenance of way of this road and of the Astoria & Columbia River, with office at Portland, Ore.

Mr. W. R. Hastings has been appointed superintendent of construction of the signal department of the Chicago, Rock Island & Pacific, with office at Chicago.

Mr. A. L. Kendall, general foeman of car shops of the New York Central & Hudson River at West Albany, has resigned to become general salesman for the W. P. Taylor Company, Buffalo, N. Y. .

Mr. T. L. Burton has been appointed general inspector in charge of air brake, steam heat and car

lighting equipment of the Philadelphia & Reading, and will also perform such other duties as may be assigned to him.

Mr. M. P. Paret, chief engineer of the Kansas City, Mexico & Orient, has resigned to engage in the practice of consulting engineer. Until Mr. Paret's successor has been appointed the enginering department of that road will be in charge of Mr. W. W. Colpitts, assistant chief engineer.

Mr. C. M. Larson, who has been connected with the Tax Commission and the Railroad Commission of Wisconsin for several years in connection with railway inspection and appraisal work, has been appointed real estate engineer of the Toledo, St. Louis & Western and the Chicago & Alton, with office at Chicago.

Mr. J. M. Stark has been appointed engineer in charge of construction of extension of the Chicago, Rock Island & Gulf from Wildorado, Tex., to the Texas-New Mexico state line and engineer in charge of construction of the Tucumcari & Memphis, from the Texas-New Mexico state line to Tucumcari, N. Mex., with office at Tucumcari.

Mr. E. J. Ayers has been appointed supervisor of division 28 of the Pennsylvania, having jurisdiction over the track between Bryn Mawr avenue, Philadelphia, and Mile Post 39, including the Pencoyd, Phoenixville and Royersford branches of the Schuylkill division, succeeding J. P. Carlton, promoted. Mr. H. S. Trimble has been appointed supervisor of the Pennsylvania & Northwestern division and branches, succeeding Mr. W. S. Wilson, transferred.

Mr. M. C. Blanchard has been appointed acting roadmaster of the Atchison, Topeka & Santa Fe, with jurisdiction over the territory from Emporia, Kan., to mile post 227, including Sand Creek yard, succeeding Mr. L. Bradley, granted a leave of absence, and Mr. M. Connell, retired. The territory of Roadmaster William Eglinton will be extended to include that portion of the Third district from Mile Post 227 to South Winfield Junction and also Wellington district, Mulvane to east of the Wellington yards, succeeding Mr. M. Connell, retired.

Mr. E. J. Pearson, chief engineer of the Chicago, Milwaukee & St. Paul of Washington, has been appointed chief engineer of the lines west of Butte of the Chicago, Milwaukee & Puget Sound, which has taken over the Pacific coast extension of the Chicago, Milwaukee & St. Paul; and Mr. J. D. Whittemore, chief engineer of the C., M. & St. P., has been appointed chief engineer, lines east of Butte, of the new company; Mr. E. O. Reeder, assistant chief engineer of the C., M. & St. P., has been appointed assistant chief engineer, lines east of Butte, of the new company, and Mr. C. F. Loweth, engineer and superintendent of bridges and buildings. Mr. Pearson's headquarters will be at Seattle, Wash., and those of the others will be at Chicago.

Mr. Daniel D. Carothers, chief engineer of the Baltimore & Ohio, died on Jan. 2. Mr. Carothers was 48 years old and had been in railroad service for 26 years. He started out as a rodman on the Wheeling & Lake Erie, later becoming assistant engineer. In 1885 he became chief engineer of the Columbus & Cincinnati Midland, and in 1889 was promoted to the position of trainmaster and chief engineer of that road. He became engineer of maintenance of way of the Baltimore & Ohio Southwestern at Cincinnati, Ohio, in June, 1890. From this position he went with the Baltimore & Ohio, becoming superintendent of the Chicago division of that road in 1901. He occupied this position until December, 1902, when he became general superintendent of the Baltimore & Ohio Southwestern. On Feb. 1, 1904, he was appointed chief engineer of the Baltimore & Ohio, which position he held until his death. The funeral services, which were largely attended by railroad men, were held in Baltimore, and the interment at Cincinnati, Ohio.

Mr. Frank Rusch has been appointed master mechanic of the Chicago, Milwaukee & St. Paul lines west of Butte at Seattle, Wash.

Mr. E. F. Jones, acting master mechanic of the Chicago & Western Indiana, has been appointed master mechanic, with office at Chicago.

Mr. J. H. Milton, general car foreman of the Chicago & Alton at Bloomington, Ill., has resigned to become general car foreman of the Chicago, Rock Island & Pacific at Shawnee, Okla.

Mr. T. L. Burton has been appointed general inspector in charge of airbrake, steam heating and car lighting equipment of the Philadelphia & Reading.

Mr. J. A. Mellon, mechanical engineer of the Delaware, Lackawanna & Western at Scranton, Pa., has resigned.

Mr. F. F. Small, mechanical engineer of the Pacific Electric Ry. Co., has been appointed superintendent of the mechanical department, and Mr. J. Strang, general foreman of shops of the same company has been appointed master mechanic.

Mr. O. D. Greenwalt has been appointed master mechanic of the Williamsville, Greenville & St. Louis.

Mr. James McBrian has been appointed district car inspector, Choctaw district, of the Chicago, Rock Island & Pacific, with office at Argenta, Ark.

Mr. W. A. Bennett is now road foreman of engines of the Chicago, Burlington & Quincy at Edgemont, S. Dak., with jurisdiction over the line from Alliance, S. Dak., to Deadwood, and over all branches in the Black Hills.

Mr. J. F. Bowden, master mechanic of the Baltimore & Ohio, at Parkersburg, W. Va., has been appointed master mechanic of the Chicago division, with office at Garrett, Ind., succeeding Mr. D. Gallaudet, resigned to take service with another road.

Mr. B. P. Flory, mechanical engineer of the Central of New Jersey, has been appointed superintendent of

motive power of the New York, Ontario & Western succeeding Mr. G. W. West, deceased. Mr. G. W. Rink, chief draftsman of the Central of New Jersey succeeds Mr. Flory.

Mr. D. Gallaudet, master mechanic of the Chicago division of the Baltimore & Ohio, has been appointed master mechanic of the Grand Junction Terminal of the Denver & Rio Grande, with jurisdiction over the Second district, Second division; also that portion of the Second district of the Third division between Grand Junction, Somerset and Montrose, with office at Grand Junction, Colo.

Mr. E. A. Walton, division superintendent of motive power of the New York Central at Albany, has retired, and his duties have been assumed temporarily by Mr. Daniel R. MacBain, assistant superintendent of motive power at that place.

Mr. E. W. Pratt, master mechanic of the Chicago & Northwestern in charge of the lines west of the Missouri river, has been appointed assistant superintendent of motive power and machinery, with headquarters at Chicago, to succeed Mr. E. B. Thompson, who has been appointed superintendent of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn.

C. M. & St. P. Tunnel

On February 9 the Taft tunnel of the Chicago, Milwaukee & Puget Sound Railway, near Taft, Montana, was pierced. This is the longest tunnel on the coast extension of the St. Paul road, being 8,751 ft. long, and marks the practical completion of one of the most important tunnels in the history of American railroad engineering.

Concrete Stations

On the permanent line of the Panama Railroad at Gatun, a concrete station is nearing completion. This station is of a type adapted to the climate of the isthmus where the equal temperature makes outdoor waiting facilities desirable all the year around. A long platform of concrete, covered with a sheet iron roof, is divided in the center by a ticket office and news stand into two parts, one for first-class and one for second-class passengers. Each part will be provided with seats. At the south end of the platform is a two-story building of concrete blocks. The ground floor will be used for the safe keeping of baggage and express matter, and space is provided for the telegraph office. The second floor is partitioned into six rooms, a screened veranda, toilet and bath rooms, and will be fitted us as living quarters for the agent and his family. Along the front of the waiting platform and the building is a concrete walk extending to the tracks, and running to a concrete stairway by which passengers will mount to the highway that runs through the village. As the railroad cuts through one of the hills on which Gatun is built, the highway crosses the tracks on a bridge, avoiding a grade crossing.

Government Timber

Uncle Sam's national forests yielded an increase of 102 per cent in timber last year over the record for 1907, giving returns of $849,027.24 to the government. Twenty-five per cent of this amount went back to the states in which the forests are located in lieu of taxes, in accordance with the provisions of the law. This revenue will be added to the state's fund for the support and maintenance of roads and public schools.

The amount of timber cut from all the national forests was 392,792,000 feet, board measure, as against 194,872,000 feet in the previous year. This figure for 1908 does not include the 131,482,000 feet given away to settlers, schools and churches under "free use" permits. This increase of 102 per cent shows a far better use and increasing productiveness of the forest under conservative methods of cutting. There was a marked increase in small sales last year, resulting in an increase of 236 per cent in the number of sales, notwithstanding the fact that the timber contracted for was far less in the aggregate than in 1907.

Numbering Stations

In view of the widespread publicity which has been given to the unauthorized newspaper report that this company was considering the advisability of numbering its stations instead of using the present names, the Pennsylvania Railroad Company authorizes the statement that no such plan has been considered.

New Experimental Laboratory

The United States Forest Service has just decided to locate its experimental laboratory station at the University of Wisconsin, a telegram to that effect having been received from Washington by the university authorities. This new laboratory is regarded as one of the most important additions which the university has received in recent years, not only because of the advantages which will accrue to students, but because the experiments to be carried on will be of direct practical value to the paper, lumber and railroad interests of the state. The establishment of this experimental station at the University of Wisconsin was strongly advocated both by the State Timber Land Owners' Association, and by the Wisconsin Conservation Commission.

Waughop is Posted

At a recent meeting of the St. Louis Railway Club Mr. Geo. A. Post, president of the Standard Coupler Company, New York, gave an interesting talk on "The Smile Combine." He was presented by Mr. Chas. Waughop with these words:

Mr. President and members of the St. Louis Railway Club: Very few of you know that the gentleman whom I am about to introduce to you is an old doctor. I was in New York some years ago, and I was taken suddenly ill. I called for the gentleman to help

me. He saved my life—could not come. (Laughter.) However, if affords me much pleasure to introduce to you Hon. George A. Post of New York.

He not only is a good talker, but is a member of an institution which somewhat resembles the Ananias Club, presided over by our friend Teddy. He is an ex-Congressman.

I presume he is on the Ananias Club roll, otherwise he would not be here. (Laughter.)

Fighting Fires

The annual report of the insurance department of the Pennsylvania Railroad Company gives figures which indicate the efficiency of its employees. It is shown that 274 fires occurring in 1908 on property valued at more than $6,750,000 were extinguished by the railroad's own employees, with the company's apparatus. Including the fires to which city fire departments have been called, a total loss of only $346,149 has resulted from 1,397 fires on the company's property during 1908. The property endangered was valued at more than $260,000,000. Loading hot ashes or coke in cars caused 648 fires, and damage to as many cars. Fifty fires, entailing a loss of $59,019, started on adjacent property. Spontaneous combustion was responsible for a loss of $3,300. Sixteen fires resulted from careless handling of lighted cigars, cigarettes and matches, caused a loss of $3,586. Seventeen fires were due to tramps, with a loss of $14,350, and 34 fires, with a loss of $16,450, were incendiary.

Increase in Wages

Without previous announcement the Westinghouse Electric and Manufacturing Company restored to its 3,000 employes about $500,000 which was taken from their annual payroll last March when the policy of retrenchment was being pushed so hard. The only announcement was a slip in pay envelopes issued in offices from London to San Francisco, including Pittsburg, Newark and Cleveland. It was, in effect, that wages cut last March had been restored on January 1 and that the old rate of pay would be found in the envelopes.

Engineering Exhibition in England

A meeting of representative Manchester engineering firms was recently held to discuss the desirability of holding a general engineering exhibition in that city in the year 1910. The meeting was called by the International Trade Exhibitions, Ltd., of Broad Street House, London, who were the organizing managers of the recent electrical exhibition held in Manchester, and the suggestion made by this company was that the exhibition, should it take place, should be promoted by a committee appointed by the industry representing the various sections of the engineering trades, and representatives of engineering institutions, who should be the virtual proprietors of the undertaking, and who should have full conduct of the exhibition, employing the company as organizing managers and business contractors. The meeting was entirely favorable to such an exhibition being held, and a provisional committee of nine engineering firms, representing different sections, was appointed.

Locomotives and Forest Fires

Mr. George C. Henderson, formerly of the motive power department of the Atchison, Topeka & Santa Fe Ry., but now a consulting mechanical engineer, testified before the New York up-state public service commission on the question of the prevention of forest fires in the Adirondacks that the portion of the New York Central road running through the region could be equipped with oil burning apparatus in locomotives for $55,986 and operated at annual cost over coal of $139,324. The Delaware & Hudson could be changed for $33,200 and operated at a yearly increase in cost of $41,470. The New York Central's representatives submitted a plan for changes in coal-burning locomotives to prevent the escape of live coals and cinders and for the establishment of fire patrols in the woods with apparatus, etc., to cost the company $70,000 for the first year and $25,000 for operation yearly thereafter. Edward B. Katte, engineer of the electric portion of the New York Central lines, showed that electric operation of trains through the Adirondacks would cost a prohibitive figure, $9,163,000 for installation of electricity and $1,079,000 for annual operation.

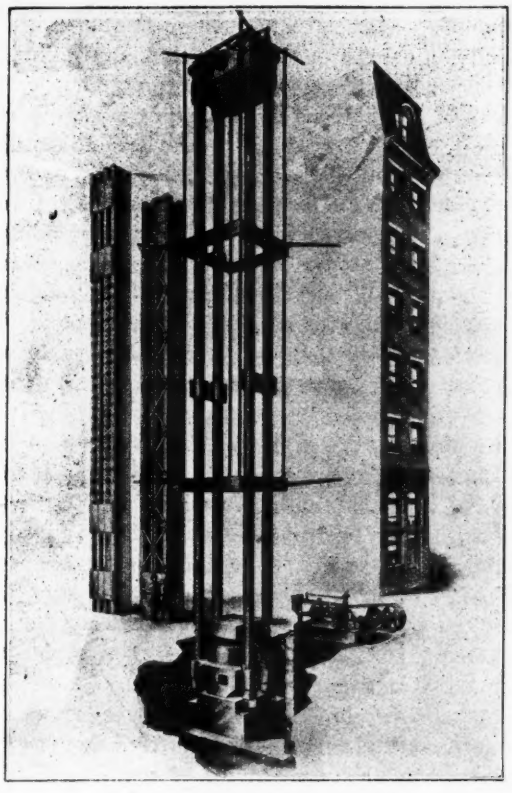
Concrete Telegraph Poles, Pennsylvania Railroad

Officials of the Pennsylvania Lines West have received and approved reports of tests made along the Pittsburg, Ft. Wayne & Chicago with concrete telegraph poles, and authority has been given to extend the use of these poles all along the Ft. Wayne and the Pittsburg, Cincinnati, Chicago & St. Louis and other lines of the system west of Pittsburg. While no specific amount of money has been set aside for this work, the engineering and signal departments have been authorized to use concrete poles for renewals at all points. It is expected that when the construction and improvement program for 1909 is taken up, orders will be issued to place many miles of concrete telegraph poles.

Ten Million Pound Hydraulic Compression Testing Machine

By Richard L. Humphrey.

A TEN million pound hydraulic compression testing machine is being constructed for the Structural Materials Testing Laboratories, United States Geological Survey, by Tinius Olsen & Company, Philadelphia, Pa., a vertical compression testing machine of ten million pounds capacity. This machine,



HYDRAULIC COMPRESSION TESTING MACHINE.

having a gross weight of over 200 tons and an extreme height above foundation of about 80 feet, is the largest ever constructed.

The machine was primarily acquired for the purpose of testing large blocks of stone made necessary by the study of the building stones of the country, as requested by the supervising architect. Inasmuch as it was deemed desirable to study the effect of flaws and defects of the various kinds in large blocks of natural stone, a machine of this capacity was determined upon. In order to care for a further request of the supervising architect, for data relative to the strength of structural columns of brick and concrete, as well as of structural steel, the original clearance between heads was increased from 25 to 65 feet. Already the need for this machine in the investigation of built-up structures is established through the urgent requests for its early completion.

Some idea of its size may be obtained from the accompanying illustration in which has been sketched one of the chords of the Quebec bridge which collapsed, and also a larger chord which was used in the Balckwell's Island bridge. It is readily apparent that this machine is capable of testing built-up structures of even greater size than those referred to.

The following brief description has been prepared because of the interest which has been manifested, and in response to the frequent requests which have been made for information concerning the machine.

The machine is a large hydraulic press, with one adjustable head, and a weighing system for recording the loads developed in it by means of the triple plunger pump. It has a maximum clearance between heads of sixty-five (65) feet; the clearance between the screws is a trifle over six (6) feet, and the heads are six (6) feet square.

The machine consists of a base containing the main cylinder with a sectional area of 2,000 square inches, upon which rests the lower platform or head which is provided with a ball and socket bearing. The upper head is adjustable over four vertical screws (13½ inches in diameter and 72 feet, 2 inches long), by means of gearing operating four nuts with ball bearings upon which the head rests. The shafting operating this mechanism is connected with a variable speed motor which operates the triple plunger pump which supplies the pressure to the main cylinder.

The weighing device consists of a set of standard "Olsen" levers upon which is weighed one-eightieth of the total load on the main cylinder. This reduction is effected through the medium of a piston and diaphragm. The main cylinder has a diameter of 50 inches, and the smaller a diameter of 5 9-16 inches. The weighing beam is balanced by an automatically operated poise weight and is provided with a device for applying successive counter weights of one million pounds each. Each division on the dial is equivalent to 100 pound loads; the smaller sub-divisions are possible by means of an additional needle beam.

The power is applied by means of a 15 h. p., 220 volt variable speed motor operating a triple plunger pump. The gearing operating the upper head is driven by the same motor.

The extreme length of the main screws necessitates splicing, which is accomplished as follows:

In the center of the screws at the splice is a three-inch threaded pin for the purpose of centering the upper and lower screws; this splice is strengthened by means of split sleeve nuts, which facilitates the removal of the sleeve nuts whenever it is necessary to lower the upper head; after the head has passed the splice the sleeve nuts are replaced.

In order to maintain a constant load a needle valve has been provided which will allow, when the pump is operated at its lowest speed, a sufficient quantity of the oil to flow into the main cylinder to equalize whatever leakage there may be. The main cylinder has a vertical movement of 24 inches.

The speed of the machine for purpose of adjustment, using the gearing attached to the upper head, is 10 inches per minute. The speed for applying loads, controlled by the variable speed motor driving the pump, varies from the minimum of at least one-sixtieth of an inch per minute, to a maximum of at least one-half inch per minute.

The contract provides that the machine shall have an accuracy of at least one-third of 1 per cent, for any

load over 100,000 pounds up to the capacity of the machine.

Some idea of the size of the machine may be obtained from a statement of the weight of its principal parts. The castings for the base and the top head weigh approximately 50,000 pounds each. Each main screw will weigh over 40,000 pounds. The lower platform weighing about 25,000 pounds, and the main cylinder 16,000 pounds. The top of the machine will be about 70 feet above the top of the floor, and the concrete foundation upon which the machine rests will be about 8 feet below the floor line.

This data is published by permission of the Director of the U. S. Geological Survey.

Engine Terminal Facilities, Wabash Railroad

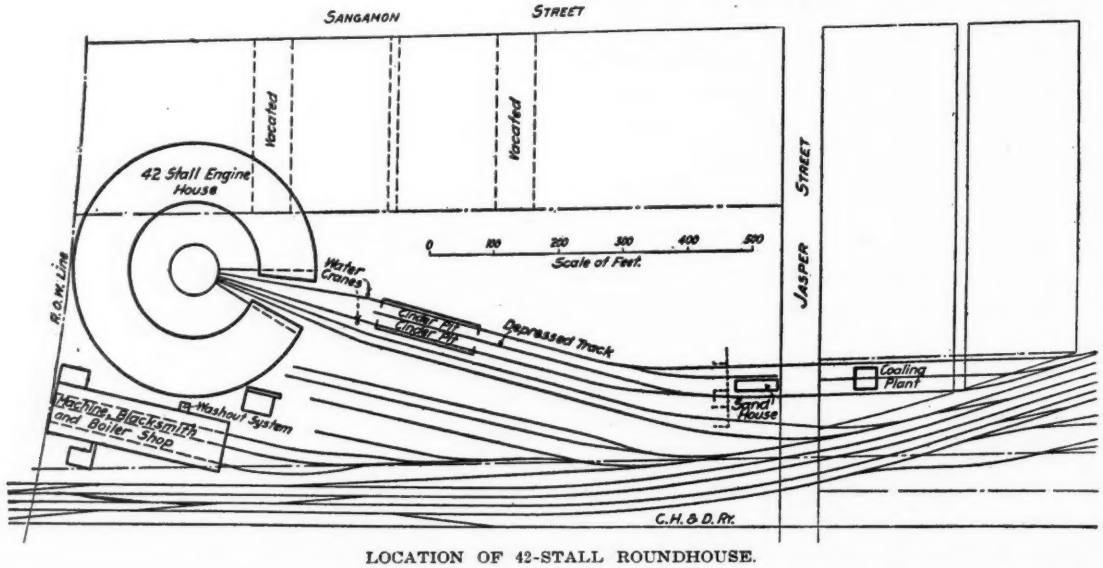
By A. O. Cunningham.

THE Wabash Railroad Company has lately spent a large amount of money in improving engine terminal facilities at Decatur, Ill. This place is situated very nearly half way between St. Louis and Chicago, and is at the junction of the Springfield and Decatur divisions of the Wabash Railroad. The Decatur division extends from St. Louis to Chicago, from Bement to Tilton, and from Bement to Altamont, and comprises 460 miles. All trains from St. Louis for points north and east pass through Decatur, so that this engine terminal is the most important on the system. There are approximately one hundred engines cared for here per day.

The first structure which it was necessary to build was the coaling chute, as the coal mine which formerly supplied the engines had practically given out. This coaling plant was constructed of timber on concrete foundations. It was designed with an elevated pocket that would hold 200 tons of coal, from which the engines could be coaled from ordinary movable aprons, and was constructed by the Fairbanks-Morse Company. Coal is brought to the chute in the bottom-dump cars and is dumped into a concrete hopper beneath the track. From this hopper it is emptied under control of the operator by gravity into hoisting buckets through an orifice in each of the two side walls of the concrete hopper. There are two of these buckets, each with sufficient capacity for holding a ton of coal, and as one bucket is hoisted the other is lowered. The full bucket on reaching the top dumps automatically into the receiving bin. The whole plant is operated by an electric motor, controlled by one man, but two men in addition are necessary to empty the coal from the bottom-dump cars.

The next improvement was the construction of a new, up-to-date roundhouse with 42 stalls, new turntable and cinder pit, with all modern facilities for doing work cheaply. It might be claimed that the super structure of this engine house is not up-to-date on account of its framework being of wood. However, there is but one other kind of material that could be used in place of wood that would last any longer, and that is reinforced concrete. We all know that steel is soon rusted out where there is an abundance of smoke; therefore, steel unless properly protected should not be used in a roundhouse. Reinforced concrete construction is expensive, and, in the writer's opinion, ot necessary because properly constructed engine houses with large timbers will last from twenty-five to thirty years, as smoke seems to preserve the timber. It is a waste of money to build such structures on Western railroads with the idea of making them everlasting, because these railroads are continually changing in their ownership and extending their lines, making it often advisable to change the location of their engine terminals and shops; and is it not also possible that railroads will be using electric motive power within a few years, requiring the reconstruction of engine shops

*Extracts from paper presented before Engineers' Club of St. Louis.



LOCATION OF 42-STALL ROUNDHOUSE.

and terminals? The only good argument for the use of reinforced concrete in buildings of this nature is the fact that it is fireproof; but there is so little danger of fire with a properly constructed engine house with heavy timbers that this argument need not be considered.

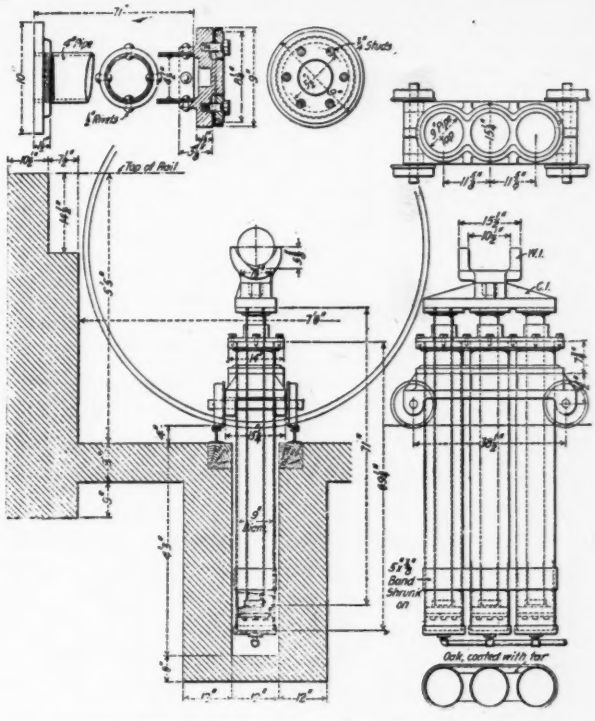
The roundhouse is a complete circle, except for an opening sufficiently large to accommodate outbound and inbound tracks leading to the turntable. The house is of heavy mill construction, the timbers being of long leaf yellow pine. The construction is of the simplest kind, with posts between the stalls carrying the roof so as to cheapen its cost. The roof beams supported by the posts run crosswise of the engine pits, and the joists, to which the roof sheathing is nailed, rest on the beams and run lengthwise of the pits. This enables the smoke from the engines entering or leaving the house to follow the joists and find exit at the peak of the roof, at which point there is provided a ventilator over each stall, each ventilator being accommodated with a pivoted shutter, which can be opened or closed by a simple mechanism worked from the floor.

The walls of the building are constructed of wooden girts of the same width as the posts, and supported between them, to which is attached expanded metal, both on the inner surface and outer surface of the girts. The expanded metal on the outer surface is plastered on both sides with a mixture of Portland cement, lime and sand, and cocoanut fiber. The expanded metal on the inner surface is, of course, only coated on one side with the same kind of plaster. This construction provides a wall with a hollow space of air between, so that dampness cannot penetrate to the inner surface. The air space forms a good insulator to keep the building warm in winter and cool in summer.

The cost of a well of this description is slightly less than brick, but a saving is made because brickwork requires foundations to support it, while this construction requires only those necessary to support the posts. Also lintels are required over openings in brickwork, and none are required in this kind of wall. A further advantage in this construction is that a continuous line of windows may be used, while with brickwork this is not possible, on account of the pilasters. The windows are made so that the two lower sashes arching together with copper chains over pulleys; thus when one is raised the other is lowered; consequently they are counterbalanced without going to the expense of providing box frames with counterweights.

The doors in front of the building are made of yellow pine substantially built and with no glass in them. They are provided with convenient hand-latching devices, which lock them at the top and bottom when they are closed.

The pits are of concrete and constructed so that in



PNEUMATIC JACK FOR DRIVING WHEEL PITS.

jacking up engines, in order to remove the parts, the jacks rest on projections built on the walls of the pit; otherwise, the floor of the house would suffer.

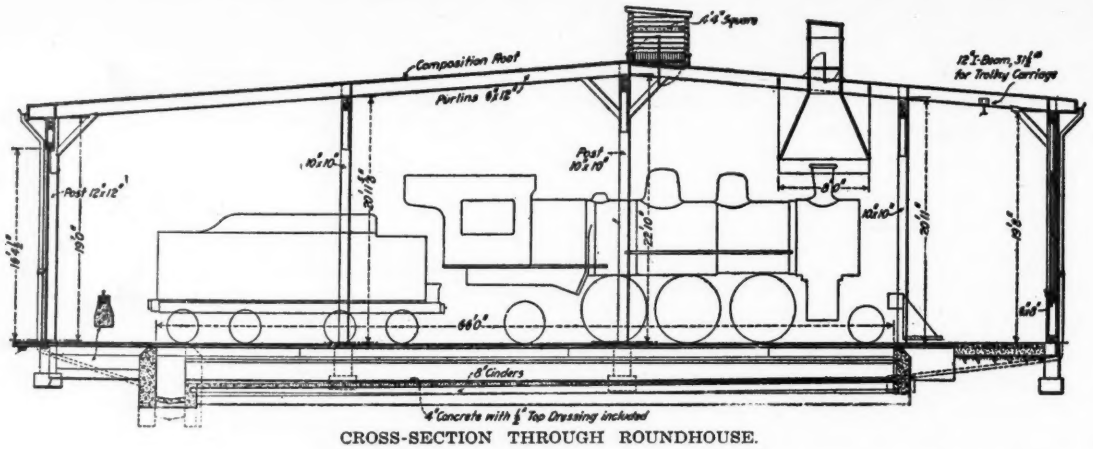
On account of the liability of concrete in proximity to the rails to break up, due probably to the oil which drips from the engines, it was decided to fasten treated timbers on the walls of the pits and to spike the rails to them.

The pits open into a concrete duct, built entirely around the inner side of the front of the house. This duct serves the two purposes of draining the pits and carrying the heating mains, and is covered with checkered wrought iron plates. In a convenient location of the house are constructed four driving wheel drop pits and two pony truck wheel pits. Over these pits the roof is carried by trusses, the posts being omitted so as to allow engine wheels to be moved between the pits and rolled out on tracks provided for them. One of these tracks connects directly with the machine shop.

The floor of the roundhouse is of concrete, built similarly to a sidewalk, and placed on cinders. It is laid out in squares of about 3 feet to the side, so if any square gets broken, as it is liable to be on account of the heavy pieces handled in a house of this description, it can be repaired at small cost.

The foundations carrying the posts are of concrete and are entirely separate from the floor, so if any settle, the floor will not be disturbed.

On the roof sheathing is laid a built-up roof of 5-ply tar and crushed limestone. The crushed limestone not only adds weight to hold the built-up roof in place, but, being white in color, helps to protect the tar from



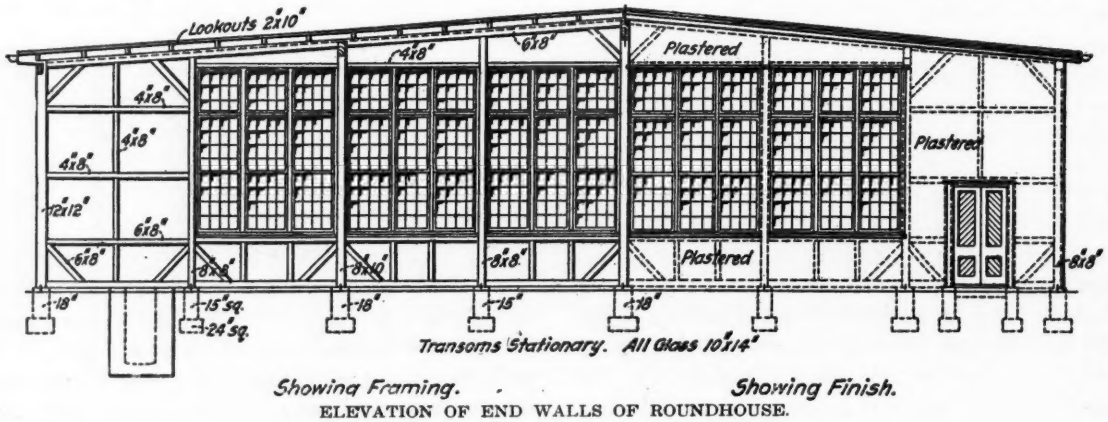
CROSS-SECTION THROUGH ROUNDHOUSE.

the rays of the sun. The cost of this roof covering in place was about the same as that of a prepared roofing.

One of the essenial parts of an engine house is the smokejack to carry off the smoke from the engines standing in the house. So far, a satisfactory one has been designed. Ordinarily, smokejacks are made of cast iron, which corrodes in a short time. Some of the asbestos board have been tried, but they have not proved satisfactory. On this account it was decided to try a smokejack made of expanded metal attached to an iron frame plastered over with a mixture similar to that used on the walls of the building. The plaster covers up the iron work entirely, and it is expected that a jack of this make will last a good deal longer than one of cast iron, with the advantage that it can be readily patched if it should become necessary. These jacks have now been in use for six months with no apparent damage to them. The only objection to them is their weight. If constructed with plaster 1¼ inches in thickness they should weigh practically the same as cast iron. The style of jack best suited for a roundhouse is an inverted hopper leading to a chimney, the bottom opening of the hopper being about 3 feet wide by 8 feet long, to permit the movement of engines two or three feet longitudinally from their proper central position, in order to get at their values, etc.

In order to facilitate the handling of material from the roundhouse to the machine shop, a telepher hoist has been provided, running on an I-Beam track, supported to the roof joists near the back of the house. This hoist is operated by electricity and will lift a load of two tons and carry it around the house at the rate of 300 ft. per minute, and in order to make it unnecessary to employ an operator continuously, a cage is provided, extending to within 3 feet of the ground, so anybody can step into it from the floor and operate the machine. Some engine houses have lately been constructed with a traveling crane with a capacity of 10 tons running around the outer circle of the house, and requiring an operator continuously, but as the maximum weight to be handled does not exceed two tons, the arrangement used in the Decatur house will do the work satisfactorily, and at much less first cost, and with practically no operating expense.

As the cost of labor for handling cinders had been very large formerly, amounting to $600 per month, it was decided to build an ash-handling system that would reduce this cost to a minimum. The structure was planned to have sufficient capacity to hold at least all the ashes deposited by the engines during twenty-four hours, and was provided with machinery with which to load the ashes economically. Concrete cinder pits were constructed in duplicate, 160 ft. in length, in order to permit three engines to be on each pit at a time. The cinders from the engines fall by gravity



ELEVATION OF END WALLS OF ROUNDHOUSE.

down an incline into a concrete pit filled with water. Cinder pits are usually hard to maintain on account of the hot cinders collecting in spots and destroying anything in close proximity to them. For this reason, the sloping sides of the pits on which the cinders drop are paved with brick. Columns supporting the track beams and rails are of cast iron of 1 inch metal filled with concrete.

In order to handle the cinders cheaply and quickly, a gantry crane is provided to run on rails between the duplicate pits, on which is hung a telpher hoist, capable of raising a 4-ton weight. This raises and lowers and operates a clam-shell bucket for picking up the cinders and depositing them in cars. A cage for the operator is attached to the telpher, so that he is directly over the bucket at all times. This gantry crane is operaed by electricity and moves lengthwise of the pit, while the telpher hoist moves crosswise of the pit. This scheme has worked admirably, and while, as stated above, it cost $600 per month formerly for labor to load the cinders, with this device it practically costs nothing, for the reason that this work is done by any hostler who may be idle at the time. A certain number of hostlers have to be employed to take care of the engines during rush hours, so that any spare time they have is utilized in operating this machine. There are 70 yards of cinders removed daily from the cinder pits.

Jas. Stewart & Company, of St. Louis, were the contractors for the house and cinder pits.

The steel work for the gantry crane was constructed by the Decatur Bridge and Iron Company.

The telpher hoist and machinery for the gantry crane, and the telpher hoist for the roundhouse, were constructed by the Case Manufacturing Company, of Columbus, Ohio.

The cost of the above improvements is given below in detail; but, as will be noticed, it does not include the value of the old buildings utilized nor the value of the old machinery and cost of labor for installing it in the machine shop.

Engine house and turntable foundations	$60,000	
Roofing	2,000	
Heating system with pump well, etc.	6,220	
Smoke jacks	2,100	
Door anchors	100	
Drainage and sewerage	1,950	
Wiring and lights	1,000	
Grading	600	
Engineering in field	1,000	
Track nsde of engne house (value)	1,675	
Telpher hoist	1,000	
Washout system and motors	6,900	
		$84,545
Track between turntable and engine house and labor laying (value)		1,955
Turntable pit and foundation	$3,360	
Tuntable	2,430	
Circle rail and track on turntable (value)	685	
Machinery for operating turntable	1,075	
		7,550
Cinder pit	$6,875	
Gantry crane	835	
Machinery for gantry crane	2,950	
Clam-shell bucket (value)	600	
		11,260
Coaling station		8,775
Sand house and machinery (value)		8,775
50,000-gal. water tank and fixtures (value)		1,100
Three water cranes with water pipes and fixtures, etc. (value)		1,000
		$118,185

NOTE.—Items with the word "value" written after them indicate that the material or structure has been formerly used with the old facilities. The amount given is the cost if new.

The Maintenance of Way Department

Gauging Track

Editor, Railway Engineering:

In spiking track we use the Huntington track gauge, and three men take the gauge, two spike mauls, claw bar and adze to regauge curves, which is done every six months. I usually leave track ⅜ in. wide on curves of three degrees and over. I have spikes driven outside the rails on one side of tie, 1½ ins. from edge of tie, and also two inside spikes on the opposite side of tie about the same distance from edge of tie. This keeps the tie from swinging around and getting out of shape, which is very essential on track where your tonnage is heavy.

On single track in regauging track I use tie plugs, bought from factory, and if ties are sound plug up the old holes, which lengthens the life of the ties, and gives a firmer grip when redriven. The adze is used to cut plugs off smooth with face of tie. Adze around spike before pulling so claw bar will go on head of spike without being driven on with spike maul, which should never be done, as you ruin your claw bar and are liable to break off a spike head. We use the Huntington gauge because it has a double jawed yoke. It has to be set square on track to be made to work properly. I always have my spikes driven straight down and not inclined as is practiced.

Yours truly,

Indiana. W. P.

Gauging Track

Editor, Railway Engineering:

When gauging track with a gang of four men and a foreman, the foreman should place his men as follows: Put one man pulling spikes with a good goose neck clawbar; one man adzing ties, so your rail when put to gauge has perfect level bearing, and the man

adzing ties should plug all spike holes with plugs furnished for the purpose, and assist in holding in the rail to gauge when necessary; the man with the gauge should gauge at least every third tie, and drive his spikes home in the tie he has gauged on, and the fourth man should follow up behind and spike everything in full. No spike should be allowed to be driven under the rail. Every spike should be driven straight down. For instance, with track running east and west, inside spikes should be driven to east side of tie and outside spike to west side of tie, and not closer to edge of tie than two inches.

I notice most all track foremen in gauging track, when using a standard gauge, use the "T" end of the gauge on opposite rail, and in so doing the man handling the gauge loses a great deal of time in geting his gauge square across the track, and in most cases does not get gauge square. I always use the "T" end of gauge on the rail I am gauging, because I have same right before my eyes and can always see when gauge is square across the track. If I get the "T" end square, I know that the knife edge of the other end of gauge must be square. By using gauge this way a great deal of time is saved in the work and you always know that you have the gauge square across the track. Adzing the ties should be watched very particularly. They should be adzed so that when the rail is to gauge that rail has good bearing and be sure that the rail is not canted. All track should be put to perfect gauge when renewing ties each year. What I call "T" end of gauge should be circular head.

Yours very truly,

Illinois. J. H.

Relaying Rails

Editor, Railway Engineering:

To relay rails, it is necessary to have a good foreman with plenty of good men, good tools, tie plugs, bolts and spikes, and a reasonable length of time in which to do the work without being rushed, which is sometimes a failing with general managers, who seem to want to turn out a lot of work in a day, but invariably have to spend more money to straighten it up than if they would have only allowed the gang to do so much for a day's work and have it completed.

Great care should be taken in the distribution of rails to see that none become surface or line bent from rough handling. Some roads have a roller device which is hooked on the side of the cars of steel which are to be unloaded, the rail being layed on the rollers and caused to roll endwise in the opposite direction from which the train is moving and come to the ground on one end, the train moving away so the rails fall to the ground with little damage. Another way is to have a roller on the rear end of the car and push the rails off on end into the center of the track, causing the train to move from under them as with the roller. Have a gang on the ground with rail tongs to set them out to each side and in this way the relaying gang does not have to carry rails across the track in setting them up. This has been my way of doing if possible, but it is necessary to have the steel loaded into drop end gondolas or on flats or some cars with an open end to do this properly.

If I have more than one car of steel in the train, I always start with the car next to the engine to avoid handling too many cars while unloading. No rail should be put in track which has a short bend in it, as it is more expensive to straighten it after it is spiked down than at the time of laying, and if not taken out at all it makes an unsightly (if not dangerous) place in the track.

After the rails have been distributed and everything is ready to start relaying, I always send a man ahead with a mixture of oil (not black oil), and oil all the bolts that are to be removed and in this way a great many bolts can be saved that otherwise would twist off or strip the threads, which is a useless waste of material. As the old bolts are removed they should be put back into the old anglebars and in this way keep the bolts, nuts and angle bars all together ready for loading when the day comes for picking up the old material.

On the morning on which the relaying gang goes to work, as the spikes are drawn, I have men follow them up closely with tie plugs and a hammer and plug all the spike holes. In this way not nearly so much damage is done to the ties as if the work is rushed pell mell and this matter overlooked regardless of later results. The work of plugging the spike holes should not be done carelessly, but the plugs should be driven their full length, or to the bottom of the holes. I prefer the sawed plugs of the Goldie style, as they are very much the shape of the spike hole.

As to the removal of spike, if an efficient spike puller could be secured that would pull the spikes perpendicularly so as not to bend them, as in the case with the old-styled claw bar and yet be light so as it could be quickly handled, it would be a great saving to the railroads, and much better work could be accomplished, as a result. This is a very important feature in relaying rails when the old spikes are to be used as with green men many spikes are driven, and in fact I will say 50 per cent of the old ones used do not stand up against the rail base. It is only a question of time till it is necessary to regauge the track which makes more holes in the ties and in a short time the ties have to be renewed. In cases where there is a shortage of new spikes I always detail enough men with small hammers to straighten all good old spikes while one man peddles them to the spikers who drive the spikes in the old holes which have been plugged, and thereby do comparatively little damage to the ties. No crystallized or throat cut spikes should be used, and in observing the above rules good work can be accomplished in the least possible time, which is likely

to be required in the face of traffic. The management should never hurry work of this kind for good work can not be done in a hurry.

Of course, to carry on work of this kind with success it is necessary to have a good foreman, with plenty of good men, tools and material. It is sometimes the custom to run section gangs from each way or the most convenient way, and I like and practice this way of doing the work, especially short jobs for long stretches. I prefer organizing an extra gang of men which takes several days to get them working right and some never do their work well which makes it necessary to discharge and take on a new man who must receive the foreman's close attention in order that he may get started right.

The foreman of a relaying gang should have a good watch, carry the correct time, observe the time card closely, and never set up more new rails than can be thrown into place and made safe for traffic between trains. A flagman should be placed each way at a safe distance before proceeding with the work. Don't hurry too much, but keep all hands busy so as to make all ends meet.

When there are low places in the old rails and the ties do not come up to the new rails, unless the track is to be resurfaced at once, shins should be used instead of bringing the ties up until such a time when they can be tamped up properly or the track surfaced. When low ties are nipped up in relaying rails, they are seldom found until a low place shows up, and sometimes the rails become surface bent, thus doing permanent damage to the side of track. The great trouble with some foremen is that they use the good enough policy, and the result is too much work is only half done. Don't rush your work. It is not the man who turns out the most work in a day that obtains the best results and is thought the most of by the management. What is worth doing is certainly worth doing right, and any foreman can do that. The free use of the adze is another necessity in the relaying of rails. A level plain should be made for the rails to sit on, and they should stand in an upright position which gives them a longer wearing chance and pays well for labor and money expended.

When there is a large force of men relaying rails, I always detail one man to keep all loose tools up with the gang and to see that no tools are left laying on the rails to get destroyed or cause a derailment. It does not matter how important the train is that passes over the new work first, I always hold them down to a safe rate of speed as no train is so important as not to take the safe side in case of doubt for no human is infallible and there might be some important matter overlooked, although I have never had it happen with me.

Some managers object to the use of points for the temporary connection between the new and the old rails, claiming that they are unsafe and instead, use a short piece of rail which opening will vary to or from the old rail due to laying around curves, difference in expansion, etc., which does not make a very satisfactory connection at all times owing to the location of ties, fit of splices, amount of bolts that can be used, and so on. I have always used the point with success which is quicker and makes a better job. I use a short piece of rail spliced to the heel of the point so as to make it lap up to the center of the rail ahead as near as possible, throwing the rail on which it is lapped out for the stock rail and with Nos. 1, 2, 3 and 4 friction plates I can make as solid a connection as is found at any switch. We will assume for example that the road on which you are relaying rails is an east and west one. If the train is coming from the west I always turn the point to the east, and if the train is coming from the east I always turn the point to the west, and thereby avoid the possibility of a wheel flange slipping between the point, and the stock rail, and at that point I spike it ½-inch wide gauge which allows the rolling stock to pass the point free. If the rails that I am putting down are heavier than the ones I am taking up I have two sets of points, one for each weight of rail that I am handling. Give me the points every time.

I never allow the men to twist the bolts up too tight, but see that they are drawn up tight enough to bring the splices up properly under the ball of the rails and to do this they carry a hammer (not a spike maul) preferably a chisel with about an 18-inch handle, which is convenient to carry and use. I also have the bolt heads hit a few light blows so as to bring them up solidly against the splice and in this way I leave a good joint and yet leave room for contraction and expansion.

In cases of expansion, I always use the regular marked expansion shims, using a thermometer and change the shims according to the different changes of temperature, but in the absence of the shims and thermometer, I would much rather get the rails a little close than too wide, as it is much better to have to cut out a piece than it is to put in one and besides you leave a more uniform job after the first summer.

I have undoubtedly covered points which a great many trackmen practice, but I am sure I have seen a great deal of shiftless work done along these lines by men who you would naturally suppose knew better, and prehaps did, but as I have above stated, they used the good-enough theory and their superior looked wisely over it and the less practical part of the management never knew the difference, except he was aware of extra expense connected with such a division. I don't say there are no good men over the country, for there are many of them on all roads throughout the United States, but as we are just now emerging from times when construction was going on extensively and good ties and other material were plentiful, some men cultivated the habit of extravagance and doing work with but little thought of after expense.

Yours very truly,

Ohio. E. L. F.

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and Maintenance of Way

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Exhibition of Railway Appliances

DURING the entire week beginning March 15th, an exhibition of railway appliances, used in construction, maintenance and operation, will be held at the Coliseum, Chicago. The show is in charge of the Road and Track Supply Association which in previous years had a small exhibit of models and drawings of railway appliances in the parlors of the Auditorium at the time the American Railway Engineering and Maintenance of Way Association held its annual meeting.

The exhibits at the Coliseum will of course be on a large scale. The supply association decided upon this course in view of the fact that railway officials prefer to see the devices themselves and in many cases the actual operation of appliances. The show is to be in accord with the importance of the engineering and maintenance of way departments of our railways.

The Coliseum was chosen for this purpose because of the convenient location and the large floor space. Of 45,317 square feet on the main floor, 32,517 square feet will be used for exhibits, and 12,800 devoted to aisles. In addition there are 9,582 square feet in the Annex to the Coliseum, of which 6,138 will be given to exhibits and 3,444 to aisles. This show will give the largest and most complete exhibit of supplies for the engineering department ever produced in this country. As heretofore it is held at the time of the maintenance of way convention and therefore a large number of railway officials are expected to attend, as an opportunity is presented to see the improvements made in different devices in which they are interested and might use to advantage.

The special March issue of RAILWAY ENGINEERING will be devoted mainly to descriptions of engineering and maintenance of way devices, and these articles will be classified and arranged to conform to the reports of the committees of the Maintenance of Way Association. The plan is to publish an issue which railway officials can use both at the convention and at the show, and our first effort in this direction is made with this idea in mind. If assistance is rendered by this issue in the discussion of the reports, that is in in the way of a reference to devices now in use, the first results will be accomplished.

At this time it may be well to call attention to the Maintenance of Way department in RAILWAY ENGINEERING which had its beginning with the January issue. These discussions by practical men should be noted particularly, as they will have a tendency to produce betterment of track methods. While the discussions are now mainly in the hands of roadmasters, other officials of experience in track work will be encouraged to take up these maintenance of way questions.

Following the Maintenance of Way convention, the April issue of RAILWAY ENGINEERING will contain a review of the reports and discussions. It is the intention to include the important points which are considered, but to condense the reports and discussions so that it will require only a limited amount of time on the part of officials to acquaint themselves with the recommendations of the American Railway Engineering and Maintenance of Way Association.

Referring again to the exhibits at the Coliseum, we have been informed that the manufacturers have taken advantage of the opportunity to show their products thoroughly. Large spaces are said to be taken and it is reported that two firms have secured over 1,500 square feet each and several over 1,000 square feet. Space that is left may be secured from John N. Reynolds, secretary-treasurer of the Road and Track Supply Association, Chicago.

Railroad Accidents

IN previous issues of the RAILWAY ENGINEERING the large decrease in railroad accidents since October, 1907, has been noted. In the Accident Bulletin for the quarter, July, August and September, 1908, it is shown that the number of casualties is again increasing.

Among the reasons for the low records in three previous quarters was the heavy reduction in traffic as well as in number of employees. In July, 1908, there

was a decided increase in this direction, and it is to this that we may credit the increase in casualties to passengers and employees.

In the quarter ending September, 1908, the number of employees killed increased seventeen per cent over the previous quarter, the number of employees killed in train accidents increased thirty-nine per cent, the number of passengers killed from causes other than train accidents increased thirty per cent, and the number of passengers killed in train accidents increased about three hundred per cent. The latter figure shows how important it is to continue a systematic investigation of the signaling systems now in use. It is found, however, that eight of the more serious accidents occurred on the lines where the block system was not in use. Regarding the collisions and derailments in the quarter mentioned above there was a total of 2,567, or 1,170 collisions and 1,397 derailments.

The number of employees killed in coupling increased from thirty to thirty-nine for the quarter ending September, 1908. The accidents in coupling and uncoupling cars were due to reasons given in previous statements, and included such as the adjustment of coupler with foot, the coupling of damaged cars, uncoupling without using lever, riding car to uncouple and unexpected movement of cars. Now we may expect a greater increase in railroad accidents as traffic increases, but it is to be hoped that the earnest attempts to prevent same may be felt in the coming year.

The All-Steel Car

A VERY interesting debate was held a short time ago at a meeting of the Car Foremen's Association of Chicago, in which question of wood versus steel cars was the subject. In this discussion the cost of all-steel cars was one of the important factors, and it was shown that the steel car exceeded the wood car in cost by about fifty per cent. While this cost may be materially reduced there is no doubt that the all-steel car will not reach in cost the lower figure for the wooden car or composite car.

The cost, however, is not the only important factor in determining the value to the railroads of one car as against the other. The cost of repairs as viewed in several ways is very important. It is contended that the wood car can be repaired more easily than the steel car, as the material for repairs is always on hand, thus keeping the cars in service. On the other hand, the steel car is said to require few repairs, that is, the minor repairs do not put it out of service. It is very difficult to determine a fair comparative percentage of each type of car that is out of service for defects in consideration of the life of steel and wood cars that are now in use. Some figures were given, however, on this point and were amplified by comparison of figures both for loss of service and cost of switching. It was estimated that there would be a saving of $10,000 per year by a road using 50,000 steel cars exclusive of saving that might arise through the difference in the cost of repairs.

An objection was made to the all-steel box car in that it is not adapted for general use, in view of the fact that these cars would become very hot, when closed and sealed in hot weather, and also on account of rust and sweating of the car.

The discussions do not relate to the composite car which is generally considered the best car that can be built for certain purposes, at least at the present time. The builders of all-steel cars, particularly all-steel box cars, are improving their designs and it may be in the very near future that the more important objections or at least the valid ones will be eliminated. In the above notes on the discussion all points that were brought out are not included, as it was intended merely to give a general idea of opinions that may be held by railroad men. The statements are not credited to the speakers because they were elected to take one side or the other of the question, and therefore offered all possible evidence to win the debate for their side.

Mt. Union Tie Treating Plant, Pennsylvania Railroad Company

THE Pennsylvania Railroad Company, in awarding a contract for the erection at Mt. Union, Pa., of a "one-cylinder" plant for the treatment of timber by any standard process, has taken the initial step toward the preservative treatment of its crossties and other timbers. In connection with this plant, two creosote storage tanks of 500,000 gallons capacity each are to be erected at Greenwich Point, Philadelphia. These tanks will have a combined capacity sufficient to receive a tank steamer cargo of oil, that will be shipped to Mt. Union in tank cars as needed. The treating plant will have a capacity of from 1,500 to 2,000 ties a day, if day and night shifts of hands are worked. This will give an annual output of about 500,000 ties.

Mt. Union was selected as the site for the first plant because it is near the center of a tie producing region, and, in addition, is a convenient receiving and shipping point. The plant is to be located on a comparatively level tract of company land comprising about 50 acres, directly north of the new line. Connections from the tie yard and loading platform to the old main line—now a freight yard—will be made by a track under the new stone arch bridge over the Juniata river at this point.

During 1907, 840,000 hardwood ties were obtained along the Middle Division of the Pennsylvania Railroad, while the Eastern Pennsylvania Division, of which the Middle Division is a part, produced 1,250,000 ties. Eliminating the white oak and chestnut, which do not take treatment readily, and including the miscellaneous hardwoods, such as beech, maple and birch, which, if treated, make excellent ties, the territory trib-

utary to Mt. Union should produce enough ties to supply a one-cylinder plant for many years to come. Other plants, if built, will probably be located at Tidewater points tributary to the larger supplies of treatable southern woods, such as gum, mixed oak, and shortleaf and loblolly pines.

The Mt. Union tie yard will occupy an area of about 17 acres. There will be six tracks about 1,500 feet long and 73 feet apart. There will be ample space for adding other tracks as they are needed. The capacity of the yard will be from 450,000 to 600,000 ties, depending on the height to which they are piled. All timber treated will be given not less than six months of summer seasoning in this yard.

The treating cylinder and machinery to be used in the plant are as follows:

One (1) treating cylinder, 6 ft 2 in. by 131 ft., complete with dome, steel float and dial; cast steel door at one end, fastened to frames by means of 28 steel bolts 2½ in. in diameter; steel angle rails of inverted type, 24-in. gauge, supported upon steel brackets with guards; heating coils and hoods; 4-in. perforated wrought iron agitation pipe for the Card process; saddles, foundation bolts, etc. The shell is to be ¾-in. boiler steel made of 17 plates sheared with bevel not to exceed one to three, longitudinal seams butt-strapped inside and out and triple riveted, circular seams to be double riveted, lapped joints, and all rivet holes reamed. The maximum stress is not to exceed 1,500 pounds T. S., while the shell and all the parts are designed for a hydraulic working pressure of 200 pounds to the square inch.

One (1) 4,320-gallon measuring tank 9 ft. ½-in. diameter by 9 ft., with heating coils, air coils, measuring board, etc.

16 ft., with cover, heating coils, etc.

One (1) 28,800-gallon working tank, 17 ft. 6 in. by

One (1) 100,000-gallon creosote storage tank 28 ft. 7 in. by 21 ft. open at top but with heating coils, etc.

One (1) 20,000-gallon wood zinc-chloride solution tank 14 ft. 3½ in. by 16 ft. 8 in. for Card process.

One (1) 45,000-gallon water tank 17 ft. by 29 ft. 6 in. with hemispherical head and tower.

One (1) air compressor duplex, size 10 in. by 10 in. by 12 in. with an air receiver 5 ft. 4 in. by 10 ft.

One (1) vacuum pump with jet condenser 14 in. by 20 in. by 24 in.

One (1) circulating pump duplex.

One (1) pressure pump special duplex 7½ in. by 4½ in. by 6 in.

One (1) service pump special duplex 8 in. by 7 in. by 12 in.

One (1) fire pump duplex 12 in. by 6 in. by 12 in.

One (1) centrifugal 6 in. special pump (for Card process) direct connected to engine.

One (1) 10-kw. generator direct connected to engine.

One (1) 150-h. p. 125 lb. steam pressure boiler with corrugated flues.

Two (2) double drum double cylinder hoists 8 in. by 12 in., with sheaves, operated by compressed air.

Eighty (80) tie cars with roller bearings.

Twelve (12) bolster cars with roller bearings.

While the plant will be equipped for any process of recognized value it will operate mainly with creosote. The agitating pipes and rotary pumps are for the use of an emulsion of zinc-chloride and creosote. This process materially reduces the cost of treatment, and it is anticipated that it will find application in the treatment of certain woods which do not readily take creosote, and that with these woods the maximum absorption of creosote can be given and in addition the center of the timber impregnated with zinc-chloride combined with the lighter creosote oils which will be filtered out of the emulsion and carried in with the zinc-chloride during treatment.

In addition to the above a small experimental cylinder to hold three ties, with the necessary tanks, pumps, etc., is to be installed. This cylinder is designed for a working pressure of 400 pounds to the square inch and must meet very exacting conditions in the experimental treatment of the refractory woods available in Central Pennsylvania.

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*Strength of Concrete Joints**

By Joshua L. Miner.

AN important feature in monolithic concrete construction that has elicited some discussion, but on which little has been published beyond the opinions of various authorities, is the strength of the adhesion, or bond, of new concrete to old. It is quite often impossible for a foreman to finish, for causes unforeseen, a unit or predetermined amount of concreting in a single day. In large pieces of work it is seldom that concreting continues night and day, obtaining a solid mass of concrete, but in almost every piece of work fresh concrete is joined to concrete that has already set or hardened. Every engineer, contractor and foreman has his own methods for joining new concrete to old. For the purpose of determining the comparative strengths of these different joints, the following series of tests were undertaken at the laboratories of Lafayette College, and the results are given in the following pages. In this work I have been assisted by Messrs. Spengler and Walters of the present senior class in the Department of Civil Engineering. The following kinds of joints were tested:

B—Dovetail joints.

C—Vertical joints roughened with cold chisel.

D—Reinforced vertical joints.

E—Scarf joints.

F—Scarf joints scrubbed with oxalic acid.

*Extracts from paper presented before the Engineers' Society of Western Pennsylvania.

G—Scarf joints scrubbed with oxalic acid and treated with a paste of neat cement.

H—Half and half or step joints.

The reinforced vertical joints were reinforced with two ¾-in. round iron bars, 18 ins. long, with nuts at either end. These bars were placed 1½ ins. from the bottom and 2 ins. from either side. The scarf joints were one-third the length of the beam and the step joints were 18 ins. long. The end of the male part of the dovetail joint was 4 ins. thick and the neck 3 ins. thick.

All beams were broken at the end of two months The idea was not to determine the strength of these joints at the age of two months, but rather to determine their relative value when compared with each other, or to a solid beam of the same material. In the case of the gravel beams, those beams having scarf joints were found to be stronger than the solid beams. The explanation that is offered for this freak is that these beams were made in different forms than the rest of the beams. These forms were of exactly the same dimensions as the others, but of different construction, and it was found to be quite difficult to remove the beams from these forms without injury, for which reason they were not used for any other specimens. This irregularity, however, does not materially affect the final conclusions.

All tests were made in triplicate and the average results taken, except where the breaking load of one beam was so radically different from the other two that there was a doubt as to its value. In this case the average result of the two beams most closely agreeing was accepted.

The ends and sides of the forms were made of 2-in. by 10-in. rough hemlock boards. The side pieces were held in place by cleats on the end pieces and also by iron straps and bolts. The end pieces were fastened by hooks and eyes to the sides. Wooden pallets made of 1-in. by 8-in. spruce boards, cleated to raise them one inch above the ground, were fitted inside of the forms and served as the bottoms. The surfaces of these forms were neither shellaced or oiled and received no treatment other than that they were thoroughly wetted immediately before use.

MATERIALS.

Crushed Rock No. 1—Dolomitic limestone passing 1¼ in. and retained on a ¼-in. screen.

Crushed Rock No. 2½Dolomitic limestone passing 1½ in. and retained on a ¼-in. screen.

Gravel—Obtained from a gravel pit along the Delaware river above Easton. All of it passed a 2¼-in. screen and was retained on 1/10-in. screen.

Sand—Bank sand, clean and sharp, grading from ¼ in. to dust.

Crushed Screenings—Obtained from crushed rock No. 2.

Cement—Alpha Portland. This cement, which successfully passed the specifications of the American Society for Testing Materials, both when manufactured and when used, had been stored in the concrete laboratory nearly four months before these tests were undertaken, which accounts for the generally low results that were obtained. Beams of the same dimensions and made with crushed rock No. 1, sand and the same cement when fresh, broke 30 per cent higher at half the age of similar beams in this investigation; but they were also stored in an immersion tank.

PROPORTIONING.

All proportions of the aggregates were determined from mechanical analyses as described by Messrs. Thompson and Fuller in their report on the series of tests conducted on the materials used in the construction of the Jerome Park reservoir. This method, as published in the Transactions of the American Society of Civil Engineers, Volume 59, consists in plotting fineness curves for the materials to be used, each of whose ordinates represents the percentage of weight of the total sample which passes a sieve having holes of a diameter represented by the abscissae. These curves are then combined so that the resultant curve will approach as nearly as possible a parabola, which begins at the origin of the co-ordinates and ends at the intersection of the ordinate of the diameter of the largest particle and the 100 per cent line.

To five parts of the aggregate by weight was added one part of cement. The finer particles of the aggregate were not replaced by the cement, as is sometimes done. This of course increased the percentage of the finer particles in the final mix. All proportions were made by weight, no allowance being made for moisture, as several tests showed that the small amount present was fairly constant and in no case did it exceed 4 per cent.

All mixing was done by hand on a concrete floor. The weighed stone was spread evenly about six inches deep, and thoroughly moistened; the sand and cement, mixed to an even color, were spread over the stone. The materials were turned six times; twice dry, then with a little water added from a sprinkler, more water being used during the last three turnings to obtain the desired consistency. Care was exercised in turning, to avoid heaping the concrete, thus preventing the coarser particles from rolling to the edges. Sufficient concrete was mixed at one time to make three whole beams.

The amount of water to be used was left to the judgment of the operators. It was desired, however, to obtain a concrete of medium consistency that would quake easily like jelly, when disturbed. This was found from previous experiments to give not only the densest, but generally the most uniform concrete. The amount of water used did not vary more than 1 per cent either way in any of the mixtures of the same materials.

The concrete was shoveled into the forms and thoroughly rammed, with a ¾-in. round iron bar about

30 ins. long, having a nut on the end, while being placed. At all times it was the aim to work uniformly in the preparation and testing of the specimens so that all errors or differences that might be caused by the personal equation could be eliminated or made constant.

The first half of all specimens were allowed to set 48 hours before the remainder of the beam was added. The forms were not removed until the completed beam was 48 hours old. The beams were not moved, nor were they removed from their pallets, until they were at least a week old. The concrete laboratory where the specimens were mixed, stored and tested was of constant temperature, about 60 degs. Fahr., and somewhat damp, so it was not considered necessary to guard against the specimens drying out too rapidly.

The beams were tested under a transverse load over a 5-ft. span, the load being applied one foot each way from the center of the span. A 200,000-lb. Riehle testing machine was used. Resting on the V-blocks which supported the beam was a wooden frame, which cleared the beam. This frame extended along both sides of the beam and midway between its supports were fastened two dial test gauges, which read to one thousandth of an inch. Strapped to the sides of the beam, midway between the V-blocks, were two brass rods, which supported two adjustable arms. At the ends of these arms were set screws bearing against the contact points of the dials. As the beam deflected the arms released the contact points and the deflection was thus indicated on the dial. This arrangement gave two readings, one for either side, and the average of these results gave the mean deflection of the beam at the center of the span for each reading.

The load was applied in increments of 200 lbs. and the deflection noted each time. The apparatus for measuring the deflection of the beam was designed by Prof. J. M. Porter, Dean of the Civil Engineering Department at Lafayette College. In Fig. 1 are shown sketches of the various joints tested, and the location of the fractures in the broken beams.

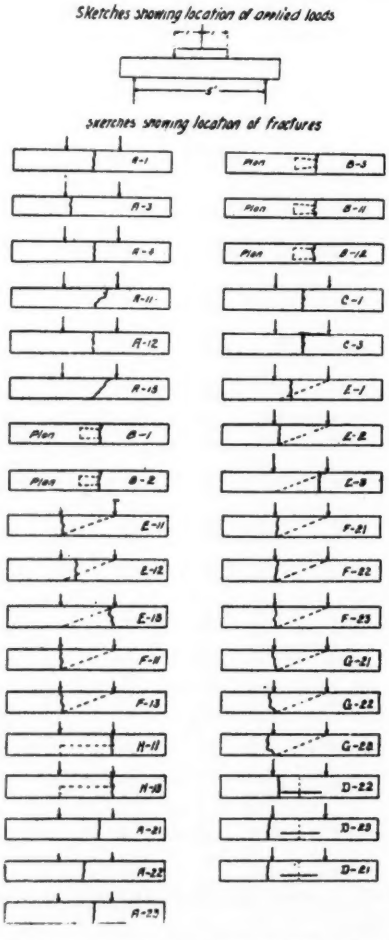

FIG. 1—STRENGTH OF CONCRETE JOINTS.

GENERAL DATA.

FOR MEDIUM CONSISTENCY

Crushed Stone No. 1, sand and cement required 8 per cent water.
Crushed Stone No. 2, crusher screenings and cement required 10 per cent water.
Gravel, sand and cement required 7.5 per cent water.

	Pounds per cubic foot.
Sand	100
Crusher screenings	110
Crushed stone No. 1	85
Crushed stone No. 2	96
Gravel	116

Each beam contained 2.66 cu. ft. and required the following quantities of materials:

	Pounds.
Crushed stone No. 1	232
Sand	154
Cement	77
Water	37
Total	500

	Pounds.
Crushed stone No. 2	255
Crusher screenings	137
Cement	78
Water	47
Total	517

	Pounds.
Gravel	308
Sand	77
Cement	77
Water	35
Total	497

RESULTS.

Beams of Crushed Stone No. 1 and Sand.

Series A—Solid Beams.

Beam A-1. Discarded as the breaking load, 2200 lbs., was too low. Modulus of rupture, 232 lbs.

Beam A-2. Injured while hardening and was not tested.

Beam A-3. Failed near one of the applied loads at 3100 lbs. Modulus of rupture, 327 lbs.

Beam A-4. Failed at the center at 3450 lbs. Modulus of rupture, 364 lbs.

BEAMS	STONE No. 1.					GRAVEL					STONE No. 2				
	1	2	3	4	Average	11	12	13	14	Average	21	22	23	24	Average
Solid Beams.....A	(2200)	*	3100	3450	3275	1700	(950)	1850	.....	1775	2900	3700	3000	.....	3200
Dovetail Joint.....B	(1400)	1900	1800	.....	1700	1350	1350	*	.....	1350	.....	.....	.....	.....	.....
Vertical Joints, Roughened.....C	750	*	1050	.....	900	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vertical Joints, Reinforced.....D	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2900	3100	3700	.....	3233
Scarf Joints.....E	2150	2300	2450	.....	2300	1850	1900	1750	.....	1833	.....	.....	.....	.....	.....
Scarf Joints, Washed Oxalic Acid..F	.....	.....	.....	.....	.....	2150	*	2250	.....	2200	3900	2900	3500	.....	3433
Scarf Joints, Washed Cement.....G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3200	2700	3700	.....	3200
Half and Half, or Step Joints.....H	.....	.....	.....	.....	.....	800	550	*	.....	675	.....	.....	.....	.....	.....

* Beam injured and was not tested.

TABLE 1.

Average results for series: Breaking load, 3275 lbs. Modulus of rupture, 345 lbs.

Series B—Dovetail Joints.

Beam B-1. Failed at neck of male half of joint at 1400 lbs. Modulus of rupture, 147 lbs.

Beam B-2. Failed at neck of male half of joint at 1900 lbs. Modulus of rupture, 200 lbs.

Beam B-3. Failed at neck of male half of joint at 1800 lbs. Modulus of rupture, 189 lbs.

Average results for series: Breaking load, 1700 lbs. Modulus of rupture, 178 lbs.

Series C—Vertical Joints Roughened.

Beam C-1. Failed at the joint at 750 lbs. Modulus of rupture, 79 lbs.

Beam C-2. Broke in handling.

Beam C-3. Failed at the joint at 1050 lbs. Modulus of rupture, 110 lbs.

Average results for series: Breaking load, 900 lbs. Modulus of rupture, 94 lbs.

Series E—Scarf Joints.

Beam E-1. Failed at least section of under half of joint at 2150 lbs. Modulus of rupture, 226 lbs.

Beam E-2. Failed at least section of under half of joint at 2300 lbs. Modulus of rupture, 242 lbs.

Beam E-3. Failed at greatest section of under half of joint at 2450 lbs. Modulus of rupture, 258 lbs.

Average results for series: Breaking load, 2300 lbs. Modulus of rupture, 242 lbs.

Beams of Gravel and Sand.

Series A—Solid Beams.

These were the solid beams that broke under a smaller load than Scarf Joint beams of the same materials.

Beam A-11. Failed with an irregular fracture slightly to right of center of beam at 1700 lbs. Modulus of rupture, 179 lbs.

Beam A-12. Failed midway between the applied loads. Result discarded, too low, at 950 lbs. Modulus of rupture, 100 lbs.

Beam A-13. Failed with a slanting fracture slightly to left of center of beam at 1850 lbs. Modulus of rupture, 195 lbs.

Average results for series: Breaking load, 1775 lbs. Modulus of rupture, 187 lbs.

Series B—Dovetail Joints.

Beam B-11. Failed at neck of male part of joint at 1350 lbs. Modulus of rupture, 142 lbs.

Beam B-12. Failed at neck of male part of joint at 1350 lbs. Modulus of rupture, 142 lbs.

Beam B-13. Was injured in handling and was not tested.

Average results for series: Breaking load, 1350 lbs. Modulus of rupture, 142 lbs.

Series E—Scarf Joints.

Beam E-11. Failed at least section of under half of joint at 1850 lbs. Modulus of rupture, 195 lbs.

Beam E-12. Failed at least section of under half of joint at 1900 lbs. Modulus of rupture, 200 lbs.

Beam E-13. Failed at greatest section of under half of joint at 1750 lbs. Modulus of rupture, 185 lbs.

Average results for series: Breaking load, 1833 lbs. Modulus of rupture, 193 lbs.

Series F—Scarf Joints Scrubbed with Oxalic Acid.

Beam F-11. Failed at least section of under half of joint at 2150 lbs. Modulus of rupture, 226 lbs.

Beam F-12. Was injured when removing forms and was not tested.

Beam F-13. Failed at least section of under half of joint at 2250 lbs. Modulus of rupture, 237 lbs.

Average results for series: Breaking load, 2200 lbs. Modulus of rupture, 231 lbs.

Series H—Half and Half Joints.

Beam H-11. Failed at lower vertical joint at 800 lbs. Modulus of rupture, 84 lbs.

Beam H-12. Failed at lower vertical joint at 550 lbs. Modulus of rupture, 57 lbs.

Beam H-13. Failed while being handled.

Average results for series: Breaking load, 675 lbs. Modulus of rupture, 70 lbs.

Beams of Crushed Stone No. 2 and Crushed Screenings

Series A—Solid Beams.

Beam A-21. Breaking load 2900 lbs. Modulus of rupture, 306 lbs.

Beam A-22. Breaking load 3700 lbs. Modulus of rupture, 390 lbs.

Beam A-23. Breaking load 3000 lbs. Modulus of rupture, 316 lbs.

Average results for series: Breaking load, 3200 lbs. Modulus of rupture, 337 lbs.

Series D—Vertical Joints Reinforced.

The inforcement for these joints extended only nine inches either side of the joint. But it was sufficient to insure the beams against failure at the joint. The fracture occurred each time beyond the reinforcement and near one of the applied loads. After the tests on this series had been completed the sections of the beams containing the reinforced joints were retested. The span in this case was 17 ins., or one inch less than the length of the reinforcement. The load was applied at the center of the span and directly at the joint. The fracture occurred in this instance near the end of the reinforcement and was caused primarily by the slipping of the iron and nut. The average breaking load of these beams was a few pounds greater than that of the solid beams; but the difference is so slight that it need not be considered. Further, this result should be expected, as the fracture occurred beyond the reinforcement.

Beam D-21. Broke at 2900 lbs. Modulus of rupture, 306 lbs.

Beam D-22. Broke at 3100 lbs. Modulus of rupture, 327 lbs.

Beam D-23. Broke at 3700 lbs. Modulus of rupture, 90 lbs.

Average results for series: Breaking load, 3233 lbs. Modulus of rupture, 341 lbs.

Series E—Scarf Joints Rubbed with Oxalic Acid.

The average breaking load of these beams, as in the case of those made with gravel, was greater than that of the solid beams. The writer is at a loss to offer an acceptable explanation for these results. The difference in this case is not great and might be overlooked. All the beams failed at the least section of the under half of the beam or joint.

Beam F-21. Breaking load 3900 lbs. Modulus of rupture, 411 lbs.

Beam F-22. Breaking load 2900 lbs. Modulus of rupture, 306 lbs.

Beam F-23. Breaking load 3500 lbs. Modulus of rupture, 369 lbs.

Average results for series: Breaking load, 3433 lbs. Modulus of rupture, 362 lbs.

Series G—Scarf Joints Scrubbed with Oxalic Acid and Treated with Paste of Neat Cement.

The average results for this series are the same as those for solid beams, and only 233 lbs. less than those scrubbed with the acid but not treated. It would seem from this that no real advantage is gained by treating the surface of the joint with paste of neat cement. Failure in all these beams occurred at the least section of the under half of the joint.

Beam G-21. Breaking load 3200 lbs. Modulus of rupture, 337 lbs.

Beam G-22. Breaking load 2700 lbs. Modulus of rupture, 285 lbs.

Beam G-23. Breaking load 3700 lbs. Modulus of rupture, 390 lbs.

Average results for series: Breaking load, 3200 lbs. Modulus of rupture, 337 lbs.

Table 1 gives a recapitulation of the results obtained in this series of tests, showing the breaking loads.

CONCLUSIONS.

The reinforced joint proved to be the strongest joint tested, failure occurring not at the joint but beyond the reinforcement. Of the different scarf joints, which were the next strongest, those scrubbed with oxalic acid were a little stronger than those not scrubbed. The treating of the surface of the joint with a paste of neat cement, from the results of these tests, proves to be of but little value. The dovetail is the next strongest joint. This type of joint, although stronger than the remaining kinds, seems to be much weaker than the scarf joints. The vertical joints roughened and the half in half, or step joints, were the weakest of all those tested. In every case they gave a low breaking strength, frequently breaking while being handled.

Railway Business Association

By G. M. Basford.

FOR sixty days out of the one hundred and twenty days of the life of the Railway Business Association it has been the good fortune of the writer to be associated with this unique movement, and it is with regret that pressure of his own work makes it necessary for him to turn over to other hands the official duties of the position of secretary. A pleasant obligation will be fulfilled if some additional light may be thrown upon the accomplishments and possibilities of the work of the association from the inside.

It is doubtful if any association has ever before in such a brief period received such co-operation and recognition. Never before have the commercial interests dealing directly with the railroads been organized in such a way as this.

For very well understood reasons the railroads have not yet begun to share in the return of prosperity and while many commercial interests are busier than they were, those concerned in supplying railroads with material and equipment have been unable to secure orders sufficient to put their men back on full time. This serious situation brought together our members in an effort to effect a change in public opinion which would lead to an improvement of the general railroad situation and aid in restoring normal conditions.

This movement was not only necessary, but timely. The pendulum of popular sentiment had swung adversely to the railroads and swung too far, as indicated by a large amount of legislation, which affected the transportation interests by increasing the cost of railroad operation, while curtailing revenues.

At a recent dinner in New York the statement was

made that during the years 1906 and 1907 the British parliament enacted 114 laws for the government of Great Britain and colonies, whereas during the same time Congress and the state legislatures of the United States enacted 25,000 laws. It is reasonable to doubt that 12,000 wise laws per year can be enacted in any country. The thinking people who constitute the safeguard of the nation had begun to recognize that the railroad interests could not be adversely affected by restrictive legislation without affecting all other human interests. There has been no general sentiment in favor of weakening restriction of railroads, but there is a growing conviction that restriction must be intelligent.

The way in which the members of the association rallied to the call is scarcely more impressive than the ready support of the commercial public. By a combination of very important manufacturing concerns into a good natured association, public opinion has crystallized to a gratifying extent and legislators, both state and national, have heard from the people in a voice devoid of quavering.

Some of the largest commercial associations have been ready and willing, at the suggestion of this association, to make pacific utterances. Responses from the largest cities and from national associations covering the entire country have been surprising. The voice asking for legislative quiet and for true statesmanship with respect to railroad enactments has come from many directions and from many interests, some of them being entirely separated from railroad affairs. Those, for instance, who make and sell shoes have co-operated through their national organizations to indicate appreciation of the fact that the welfare of those concerned in transportation is involved with their own welfare to such an extent as to justify a long step from their beaten paths to correct the unfortunate situation in which our members find themselves.

One reason for this co-operation lies in the recognition of the fact that the personnel of the association is remarkable in including men known for the most successful engineering, manufacturing and commercial achievements. Some of our constituent concerns are as large commercially as a fairly large railroad. Our association has conflicting competitive interests, all united in the bond of good fellowship to carry out the plan which makes for the common good. This plan is conducted absolutely independent of the railroads. It has been shown for the first time to be possible for influences outside of the railroads to band together to promote by organized action a realization of the interdependence between the public and the transportation interests.

Our activities are by this time very well known. In four months the fact has been demonstrated that the people are ready not only to acknowledge what the railroads have done for the country, but to give transportation questions the consideration which they deserve. To turn the light on obscure questions affecting the relations between the people and the railroads, tending to prevent extremes in legislation, constitutes a permanent work for this organization.

Not all the work already accomplished has been easy. The railroads as well as the public have their part to do and the work of the association will include efforts to bring about a permanent friendly relationship. This cannot be done in a short time.

One of the most effective elements of the success of this association is the generous good fellowship of its members. The organization already extends into sixteen states and often competitive interests in the same city are united in local achievement. No discordant notes are heard in the conduct of its affairs and it is inconceivable that any will be heard under the leadership of such a personality as that of the president of the association, sustained by, and enjoying the constant counsel of the able, energetic and potential men who compose its general executive committee. These two months in the executive office have been so crowded with important development that they have seemed exceedingly short.

At the outset reasonable doubt of the possibilities of the movement may have been justified. Some may have felt that it was too intangible and experimental to win their instant support. Now there is no room for doubt. It is no longer experimental. The writer regrets that because of compelling business obligations he cannot continue in direct co-operation with a work so inspiring. This brief time has convinced him that the need for the organization was great, the field of its efforts wide, the plan of its work effective.

It is equally clear that so much remains to be done as to justify the question: How can any concern engaged in supplying the railroads with their requirements, delay enrollment in the Railway Business Association?

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*Steel Rails in Canada**

By F. P. Gutelins.

THE standard weight of rail of the Canadian Pacific Railway for 1908 is 85 lbs. Our previous standard was 80 lbs. American Society Section.

The section is what is known as the Canadian Pacific Railway, 1908, 85-lb. rail section, as per diagram shown herein. This new section can best be described by comparing it with the American Society of Civil Engineers' 80-lb. section, which has five-inch base, and is five inches in height. Canadian Pacific Railway, 1908, 85-lb. rail has ⅛-inch added to the thickness of the base. The radius of the web has been decreased from 12 inches to 8 inches, thus giving a wider web where it joins the head and the base. The sides of the head are slightly inclined (the old 80-lb. rail had perpendicular sides to its head) and the radius of the top of the head is 8 inches, instead of 12 inches. This new rail has a little rounder head, the radius being four inches less than in the old rail. The new section, therefore, has a 5-inch base, and is 5⅛ inches in height. It differs from the new section rec-

*Extracts from paper before Canadian Railway Club.

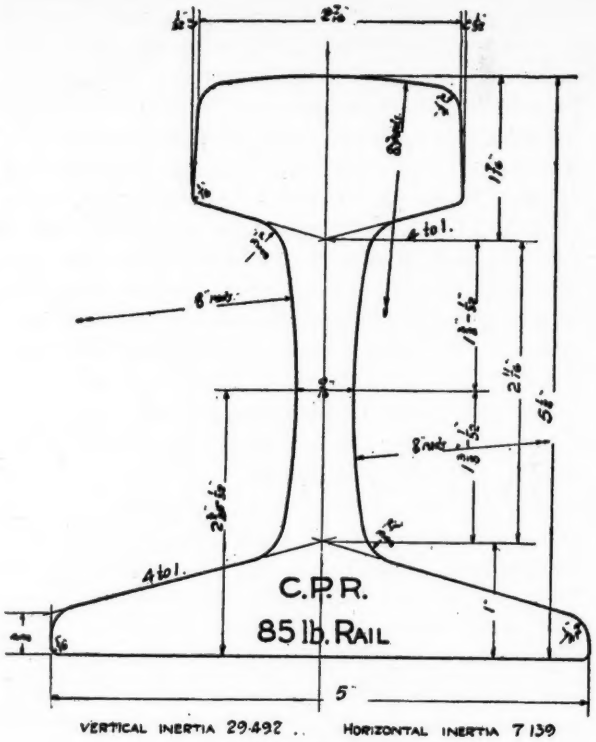
ommended by the American Railway Association in that the base has not been narrowed. The writer does not feel that in the redistribution of material,—I do not know if this is entirely clear to you,—the thinner the flange, the hotter the mass of steel in the head must be to roll the finished rail of that section. The thicker the flange the lower the temperature of the steel in the head; the temperature in the flanges being the same in both cases—in the new rail section, which all rail section designers consider is necessary, that the narrowing of the base is justifiable, as it makes the rail more unstable, introducing an element of danger which cannot be counterbalanced by the advantage that would be gained by the more uniform cooling of the half-inch narrower flange.

The Canadian Pacific Railway Company have had 85,000 tons of rails of this section rolled, which are now in the track.

The advantages of this section, from the mill standpoint, are that the finished rail, when approaching the hot saws, is of more even temperature in all parts of the section, and, as a result, the temperature of the head is very much less than in the old section, giving a finer grain of steel, therefore greater wearing quality. Second, the more equal distribution of material between the head and the base simplifies the cold straightening process to such an extent that the mill people advise that the work of straightening is less than 40 per cent of what was required in the old section. The straightening of rails under the cold press is a punishment, which seriously impairs the strength of the rail, and frequently appears to open defects or starts fractures which would never be known in ordinary wear during the life of the rail.

In designing a rail for use in Canada the conditions of winter roadbed must be provided for. The roadbed when frozen is absolutely rigid, and, in the process of freezing, ties under which there is a quantity of moisture heave on account of the action of the frost to such an extent as to require wooden shims on the adjoining ties to maintain an even bearing for the rail, and give proper surface to the track. At the same time the shimming becomes necessary the rails must bend sufficiently to receive their proper support from the low ties, and, if the rail be too rigid, or too hard, it is liable to break. For this reason, we deemed it wise to limit the height of the rail to 5 or 5⅛ inches, and place the additional strength on those portions of the rail which are most liable to crack or break. This conclusion was arrived at after an experience of seven years, with about 50 miles of A. S. C. E. section of 100-lb. rail, in which, with an equal amount of heaving and equally rigid track, more square breaks occurred with the 100-lb. rails than did with an equal mileage of 80-lb. rails of the same section, handling the same traffic, under like climatic conditions. And in addition to this, I want to say that the chemical composition of the 100-lb. rail is practically identical to the chemical composition of the 80-lb. rails to which I referred.

The composition specified by the Canadian Pacific



	AREA PERCENTAGE	COOLING PERCENTAGE	VERTICAL SECTION MODULUS	HORIZONTAL MODULUS
HEAD	36·77	1·965	10·425	
WEB	22·21	5·081		
BASE	41·02	2·875	12·84	2·856
TOTAL	100·00	2·586		

STEEL RAILS IN CANADA.

Railway, in which the average carbon for Bessemer rails is .58 per cent, and for open hearth rails is not less than .60 per cent, gives a harder rail than that manufactured under commercial specifications, or demanded by most of the American railways, in which the carbon content is from 5 to 10 points lower. In the introduction of this additional carbon the Canadian Pacific Railway has arranged to reduce the phosphorus in Bessemer to .085 per cent, and in open hearth to .06 per cent, whereas the average American specification allows .10 per cent phosphorus in Bessemer, and for open hearth the standards are practically the same. This combination gives the Canadian Pacific rail greater hardness, and the same or greater toughness than is secured under the American specifications. The advantages are a better wearing rail and one which does not readily flatten at the joints under traffic. I might say here that rails purchased prior to 1902 gave the Canadian Pacific a great deal of trouble on account of the flattening of the ends. These rails flattened out at the ends as much as half an inch; clearly too soft, or at least too soft at the joints where they received the additional punishment. For this reason it was found advisable to increase the carbon to give us a harder rail, which we hoped would overcome this end flattening, and our new specifications, of which the one printed in this paper is a slight modification, increased the carbon very materially. The increased carbon rails are of such a character that we do not have flattened ends except in rare cases, and these

cases are usually rails that are defective, either on account of heat treatment, too low in carbon, or some other defect. The reason for the difference in the carbon and phosphorus for open-hearth and Bessemer rails under the Canadian Pacific specifications is the inability of the acid Bessemer rail manufacturers in the United States to produce, at commercial prices, a low phosphorus rail, so that where the phosphorus is .10 per cent, the carbon should be—I had better say, must be—kept below .50 per cent.; whereas with phosphorus .085 per cent., the carbon should not exceed .63 per cent, and should average about .58 per cent.

Trade Notes

Mr. William C. Ennis, formerly superintendent of motive power and master mechanic of various railways, of late connected with the American Locomotive Company, and now located at 543 Broadway, Paterson, N. J., has been appointed by the Falls Hollow Staybolt Company as eastern traveling representative.

Mr. J. J. Keefe, well-known in the pneumatic tool trade, has entered the employ of the Independent Pneumatic Tool Company, Chicago, as salesman and will travel out of the Chicago office.

The paper, Graphite, which is issued by the Joseph Dixon Crucible Company, Jersey City, N. J., contains some clever articles in the January issue which has recently been received. It also contains an announcement of the death of the late president of the Dixon company, Mr. E. F. C. Young, who was associated with the company for about thirty years.

The Darley Engineering Company, New York, has the following recent orders for 8-in. patented suction ashes conveyors: United States Navy, for Charleston, S. C. (fourth order from the Navy Department); Armour & Co., for South Omaha plant (fourth order from Armour & Co.); American Steel & Wire Company, for Rankin plant (third order from United States Steel Corporation and second order from American Steel & Wire Company); Quincy Market Cold Storage & Warehouse Company, Boston, Mass., for Richmond street plant.

The W. K. Kenly Company, Chicago, which is the western representative of the Kalamazoo Railway Supply Company, Kalamazoo, Mich., has appointed the Hofius Steel & Equipment Company, Seattle, Wash., its Pacific coast representative. A complete stock of hand, push and velocipede cars will be carried in Seattle. The Hofius company will also carry a stock of Latimer switch point locks.

Mr. V. K. Spicer has been appointed Canadian manager of the Union Switch & Signal Company, Swissvale, Pa., effective January 31, and will take charge of the Montreal office about March 1. Mr. W. E. Foster has been appointed western manager, in charge of the Chicago office and district, effective February 1.

The Railway Telephone & Electric Company, Chicago, has been incorporated to do a general manufacturing and sales business of electrical appliances. Capital stock, $30,000. The incorporators are: Messrs. Max W. Zabel, A. Miller Belfield and O. M. Wermich.

The Metallic Railroad Tie Company, Shirley, Ind., has been incorporated to manufacture and sell metallic railway ties. Capital stock, $10,000. The incorporators include: Messrs. George Williams, Frank Gordon, James McCune and others.

The infringement suit of S. C. Davidson, representing the Sirocco Engineering Works, against the manufacturers of the Serlano fan has been decided in favor of the plaintiff, and an injunction granted by the London court, Chancery Division, where the case was tried. The result of this suit following the same outcome of similar suits in the German courts, is especially interesting in view of the recent consolidation of the Sirocco Engineering Company with the American Blower Company. The court reports of the London suit says: "The action was practically undefended. The patent in question had reference to what was known as Davidson's Sirocco fan, and it was a fan that had become extremely well known. The defendants had a fan called the Serlano. The peculiarity of plaintiff's fan consisted mainly in it having a very large number of narrow blades, set at an angle. This had the effect of greatly increasing the volume of air. For a given quantity of air an old fan of some four or five times the size would be required. The plaintiff's fan would go into a very small space and into places where it would be impossible otherwise to get a fan of requisite capacity. This made it very useful on board ship, and there were a number of them used in the law courts. As the defendants did not now contest the validity of the plaintiff's patent, all he had to do was to call evidence to prove them infringement. Mr. James Swinburne, the well-known expert, gave evidence as to the novelty and utility of the plaintiff's invention, and Mr. Justice Parker, giving a certificate as to the particulars of breaches, granted the injunction asked for with costs, and directed an account of profits."

The Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, has recently sent out some handsome celluloid blotters, which they will furnish to any railroad official upon request.

A very handsome booklet, about 5 by 8 ins., has recently been gotten out by the Joseph Dixon Crucible Company, Jersey City, N. J. It is entitled "Lubricating the Motor," and as its name indicates, deals with the subject of lubrication of automobiles, motor boats and motor cycles. The booklet is divided into chapters which deal with the individual part of motor mechanism; cylinders, transmissions, bearings, etc. There is a chapter on tires which includes some valuable hints on this rather sensitive part of the vehicle. There are also special chapters entitled, "Overhauling the Car" and "Motor Boat and Cycle," which are self-descriptive. The booklet opens with a brief treatment of flake graphite lubrication. A good point is developed concerning the peculiar advantage of flake graphite when combined with oil or grease, due to the lack of sensitiveness of flake graphite as compared with oil or grease.

Regarding the Chief Joint Car Inspectors' & Car Foremen's Association

ON January 23, 1909, there was held at Cleveland, O., a meeting of the Executive Committee of the Chief Joint Inspectors and Car Foremen's Association. Not only were the Executive Committee present but many of the members of the association together with a number of others interested in the work of the association. The interest and enthusiasm exhibited in the discussions showed the real interest taken by the members, in the problems in the railway service which are daily confronting those who are connected with this organization. The urgent need for the work done by this association is shown most clearly by the object for which they are organized. "The freight agent solicits business, unschooled car inspectors divert it; supervision is at fault. The makers of interchange rules expect accurate interpretation. Although understanding of the book of rules and the general interchange situation, national harmony, national honesty and national unity of action everywhere by everyone, is the purpose of the association. The object sought must be accomplished and will solve the extensive problem."

Among the forty or fifty who were present when the meeting was called to order by President Boutet were the following: H. Boutet, A. Berg, George Lynch, T. J. O'Donnell, S. Skidmore, G. M. Bunting, F. M. Brown, J. V. Berg, Bruce Crandall, Jos. Dyer, D. J. Durrell, F. W. Dewey, J. W. Eager, J. F. Farran, F. H. Hansen, P. J. McGreevey, J. D. McAlpine, E. C. Pearse.

The secretary read the call of the meeting, which showed that it was called for the purpose of recommending to the M. C. B. Association changes in the M. C. B. rules.

President Boutet presented what in his opinion would be the proper changes.

"The preface of the rules to remain as they are."

"Next to this, the rules pertaining to defects, for which the delivering line is responsible, should be put together and same be made as few as possible."

"It is my idea that you make the delivering line responsible for slid flat wheels, rough journals, missing brake material, wooden brake beams, if applied in place of metal, combination of defects which denote unfair usage if occurring at the same time and on the same end of car, damaged end sill accompanied by damage to three longitudinal sills, damaged longitudinal sills if necessitating replacing or splicing of more than three sills, making the other defects on cars defects for which the owners are responsible."

"This, I believe, will facilitate the interchange and stop a great deal of argument and dissension coming up at interchange points."

"I would also change rules 125 and 126 in regard to the sending home of worn out and damaged cars, to provide for same being inspected by some disinterested person, for example, a joint car inspector at some point employed by four or more roads or some head of car department of a disinterested line, to examine the car and state whether or not the owners are responsible or if same was in such condition that it should be destroyed, if so, in the first place the road having the car in its possession to make repairs or in the latter case destroy the car sending the scrap material home."

"I think the same should be carried out in regard to private line cars, which would prevent the hauling of a great many disabled and dilapidated cars over the line."

Following the presenting by President Boutet of what seemed to be desirable changes in the rules the meeting was thrown open for a general discussion of the questions suggested by the president. The secretary, Mr. Skidmore, read the preface to the rules, and it was moved by Mr. O'Donnell and seconded by Mr. Berg that the preface to the rules stand as read. The motion was carried.

The general discussion was opened by Mr. Lynch saying that he wanted to know if he was to understand that the delivering line defects and the owners' defects were to be put under separate headings in the book of rules.

Mr. Dyer.—I think that the delivering line company's defects should be put in the front of the book of rules and the different headings as pieces, parts, etc., be put on additional pages in the book.

Mr. O'Donnell.—I suggest that simply to put under one heading the delivering line responsibility. On the first pages of the book of rules.

Mr. McAlpine.—I would like to ask if only the members of the executive committee were asked to speak at this meeting.

Mr. Boutet.—My intention was to get as many of the members as possible to come here and talk these matters over with us. We came to get whatever information we could out of the meeting and want all to say something, whether a member of the executive committee or not.

Mr. McAlpine.—I would put the delivering line and owner's defects grouped so that the inspector could familiarize himself with the delivering line defects, without having to refer to any other part of the book of rules, or in fact look through the whole book.

Mr. Crandall.—I am interested in seeing the book of rules so arranged that the inspector can see just what he is looking for without referring to the whole book. I think the rules should be grouped in such a manner that anything exceptional or important could be immediately referred to. This could be done by the use of italics or capital letters to attract attention. In this way important rules could be more easily referred to.

Mr. Durrell.—I believe the condensing of the rules would help greatly in determining just what rules our interchange inspectors and repair men are required to learn and would also be of assistance to us when reports come to our car foremen and before we are able to pass on certain cases and make our report to our superintendents, as it would enable us to get at it more quickly. I see great advantages in it and think it best to move that the executive committee recommend to the M. C. B. Association the condensing of the rules bearing on the above subjects, and the printing of same under different headings, viz., owners' responsibility and delivering line's responsibility, and eliminate everything else in the book pertaining to rules covering the subjects of responsibility. I think this would simplify matters a great deal.

Mr. McAlpine.—I think they should be separated, that they should be printed by themselves.

Mr. Boutet.—In that way it would not be necessary for an interchange inspector to know the whole book of rules; all that would be asked of him is to familiarize himself with the delivering line defects and what was safe to run.

Mr. Lynch.—As long as owners' defects and delivering line defects are under separate headings there would be no difficulty in knowing who was to pay for repairs, as the separate headings would be before them and as soon as a car needed repairs they would attach a card and make a note of it.

Mr. Durrell.—I move that for the purpose of making the M. C. B. Book of Rules, pertaining to owner's and delivering line's responsibility more readily understood and in more condensed form for the benefit of car inspectors and others having to do with the interchange of cars, that the executive committee recommend to the M. C. B. Association the condensing of the rules bearing on the above subject and the printing of same in the book of rules under two headings, viz., delivering line's responsibility and owners' responsibility, and eliminate from the other parts of the book of rules anything covering the subject of responsibility. Seconded by Mr. Hansen and carried.

Mr. Boutet.—What defects should we recommend making the delivering line responsible for?

Mr. Skidmore.—A car owner should be made responsible for all missing material on cars, except missing material pertaining to brakes. The fact of making the delivering line responsible for missing material in interchange has been ignored to a certain extent all over the country, that would show to the framers of the M. C. B. Rules that there is something radically wrong with that part of the rules. There is no benefit to anybody to make the delivering line responsible for owner's defects in interchange and I believe it would do away with a large amount of tracing, correspondence, etc., for defects cards if such was the case. The bill can be rendered against car owners for defects as well as against the delivering line.

Mr. Berg.—I think that missing brake material should also be included

Mr. Skidmore.—I did not intend that brakes missing should be an owners' defect. I wish that everyone would state their objections as that is what we are here for.

Mr. O'Donnell—Referring to Rule No. 42, it is my opinion that any missing material due to ordinary service should be chargeable to the car owners, whether the car is offered in interchange or not. In my opinion the rules should be framed to cover it in this manner.

Mr. Boutet—How about slide flat wheels? I think this is a defect for which the delivering line should be responsible.

Mr. O'Donnell.—I move that slid flat wheels and cut journals be made delivering line defects as at present. Seconded by Mr. Berg and carried.

Mr. Boutet.—How about missing brake material?

Mr. Skidmore.—That is a broad proposition since about all cars are equipped with metal brake beams and air brakes, it would not be well to make owners responsible for missing brake material in interchange.

Mr. Berg.—I would recommend that brake levers and connections missing be classed as owners' defects, train men remove broken connections in transit and at the next inspection point you treat it as missing material and only charge labor. Brake levers and connections are more frequently missing from being broken than from other causes, that is my reason for recommending making them chargeable to owners.

Mr. Boutet.—How about missing brake beams?

Mr. Berg.—I am not prepared to recommend considering missing brake beams as owners' defects.

Mr. Boutet.—We could hold owners responsible for part, for example, the P. & L. E. deliver to the Lake Shore at Erie an L. & N. Car with one brake beam and bottom brake connection and brake lever missing they would give you a card for the brake beam, lever and bottom connection missing, it being understood that the beam would cover the head and shoe, but, if on the other hand, this same car only had the bottom connection and lever missing, you would not get anything for that, but would charge the owners.

Mr. Hansen—I move that the delivering line be made responsible for missing brake material only when the beams are missing. Motion seconded by Mr. Durrell and carried.

Mr. Lynch.—I move that the rules pertaining to air brakes remain as they are because all cars must be equipped with air and the railroad companies desire air brakes kept in good condition. Seconded by Mr. Farran and carried.

Mr. Boutet.—Do you want to make the delivering line responsible for anything else?

Mr. Skidmore.—I move that the delivering line be made responsible for wooden brake beams, if applied in place of metal brake beams, when cars are so stencilled. Seconded by Mr. Bunting and carried.

Mr. O'Donnell.—I move that the delivering line be made responsible for combination of defects as follows: Three longitudinal sills, if accompanied by damage to the end sill on the same end and all occurring at the same time. That they should also be made responsible for more than three longitudinal sills if broken at the same time and on the same end to be considered as a combination on wooden framed cars. Steel underframed cars the combination to be one longitudinal sill and one end sill broken at the same time and at the same end or more than two longitudinal sills broken at one time and at the same end. All other combinations, as they now appear in the book of rules, to be made owners' defects. Motion seconded by Mr. McGreevey and carried.

Mr. O'Donnell.—I move that the following be added to Rule No. 44, beginning after the word "pocket": Any car having tandem attachments found with pocket for single spring. Seconded by Mr. Berg and carried.

RULES PERTAINING TO HOME ROUTE CARS.

Mr. Boutet.—I would suggest changing rules 125 and 126, regarding the sending home of worn out and damaged cars, provide that same be inspected by some disinterested person, as previously referred to by me. I believe, however, that the owners should decide whether the car should be destroyed or repaired.

Mr. Hansen.—I think the matter should be taken up with the owners as to whether the car should be sent home or whether it should be repaired or dismantled.

Mr. Skidmore.—I move that Rule 125 be changed to read as follows: All wooden framed cars that the person desiring redress may call in a disinterested person, such as the head of a car department of a disinterested line or his representative, or a chief joint car inspector, who is employed by four or more lines, who shall examine the car and, if he finds that the defects on the car are such that the owners are responsible for, he shall write to the owners of the car, sending a copy to the road calling him in, and the owners shall decide whether the car shall be repaired or dismantled. If the owner elects to have the car dismantled or destroyed, if the car is a 60,000 capacity car, the person destroying the car shall allow the owners second-hand price for wheels and axles, full price for air brakes, scrap material prices for all other metal. If the car is less than a 60,000 capacity car, the person destroying the car will allow the owner full price for air brakes, scrap material for all other portions of metal, except wheels, which will be allowed second hand price. Seconded by Mr. Berg and carried.

Mr. Skidmore.—I move that Rule 126 be changed to read as follows: That a metal car that is safe to run, which on account of wreck or accident or from defects due to ordinary wear and tear, shall be reported to its owner the same as in Rule 125 and the owners shall designate whether or not the car shall be sent home or destroyed. In case he elects to have the car sent home, the persons having the car in their possession shall make same safe for trainmen, as provided for by Intercar for all defects which they are responsible for. Seconded by Mr. McGreevy and carried.

Mr. Skidmore.—I have made these motions on Rules 125 and 126 on account of so many roads requesting home route cards for cars, in some cases where the repairs were not very extensive, on other cases where they have misrepresented the facts to the owners. I think it would be great deal cheaper to all railroads, especially on wooden framed cars, that the cars be repaired on the road on which they became disabled, for example, a road might get a car occasionally that they might have to rebuild, they would still have a great deal less work to do on their line than they have to do under the present rules, for it is almost impossible to get a great many of the cars that are sent home on home route cards over a line without going in the shops two or three times to have repairs made to get the cars over their line. In a great many cases they are in such condition that they are extremely dangerous to haul and could not be made perfectly safe unless the cars were thoroughly overhauled.

Mr. O'Donnell.—I move that this association recommend to the M. C. B. Association that the coupler companies be required to stamp the name of each knuckle on same as is now done on the couplers. Seconded by Mr. Lynch and carried.

Mr. O'Donnell.—My idea on pitted journals is as follows: We find lots of journals of 60 M, 80 M and 100 M capacity with defects on the journals that could be termed no other than pitted and, while it is understood that all pitted journals are supposed to be scrap, it was thought possible that the journals mentioned above could be handled as pitted journals and trued up and charged to the car owners, which would make the rule clear, as they now have to be termed as cut journals, however, this is left to the judgment of the committee in making the final report.

In accordance with the foregoing it was decided that it should be recommended to the M. C. B. Association that the Book of Rules of Interchange be changed as follows:

That the preface of the Rules remain as it is.

That the delivering line is responsible for the following defects:

Wheels slid flat, if the spot caused by sliding is 2½ inches in length or over.

Cut journals, axles bent or axles rendered unsafe by unfair usage by derailment or accident.

Combination of defects as follows:

Three longitudinal sills, if accompanied by damage to end sill on the same end and all occurring at the same time, or more than three longitudinal sills if broken at the same time and on the same end.

Journal bearings and journal box bolts, which require removal by reason of a change of wheels or axles, for which the delivering line is responsible, regardless of the previous condition of the bearings or bolts.

Cars equipped with steel or steel tired wheels and so stencilled if found with cast iron wheels.

Missing air brake hose, missing air brake pipe or damaged fittings, angle cocks, cut-out cocks, cylinders, reservoirs, triple valves, pressure retaining valves, or any parts of these items.

Missing brake beams.

Cars equipped with metal brake beams and so stencilled, if found with wooden brake beams.

Cars found with one inch air hose on one and one-quarter inch train pipe.

Cars equipped with air signal steam pipe, hose and couplings, and so stencilled, if missing.

M. C. B. Couplers not equipped with steel or wrought iron knuckles.

Cars equipped with M. C. B. Couplers and having pocket rear end attachments and so stencilled, if found with stem or spindle attachments in place of pocket.

Cars equipped with tandem spring couplers, if found with single spring pockets.

Damage to any part of the car caused by unfair usage, derailment or accident, also temporary advertisements, tacked, glued, pasted or varnished on cars. Any card or poster exceeding 5x8 inches in dimensions, bearing the name of a manufacturer or shipper occupying more than two-fifths of the card.

Cards with letters exceeding one-half inch in dimensions being considered an advertisement.

The rest of the rules in the book to read "Owners' Defects," so far as covering the defects on the car and that the prices be eliminated from the other parts of the rules.

Change Rule 125 as follows:

All wooden framed cars that a road has in their possession in an unserviceable condition and they are desirous of procuring redress from the owners on same may call in a disinterested person, such as the car department head of a disinterested line, or his representative, or a chief joint car inspector, who is employed by four or more lines, who shall examine the car and, if he finds that the defects on the car are such that the owners are responsible for, he shall write to the owners of the car, stating all defects that exist on car, sending a copy to the road calling him in, the owners shall decide whether or not car shall be repaired or dismantled at their expense, if the owner elects to have the car dismantled or destroyed, if the car is a 60,000 capacity car or over, the person destroying the car shall allow the owner second hand price for wheels or axles, full price for air brakes, and scrap material prices for all other metal. If the car is less than a 60,000 capacity the person destroying the car will allow the owners full price for air brakes, second hand price for wheels, scrap price for all other metal.

Rule 126.—To be changed as follows:

That a metal car that is safe to run, which on account of accident or serious damage by wreck or otherwise or from defects due from ordinary wear or tear, shall be reported to its owner, same as provided for by Rule 125 and the owner shall state whether or not the car shall be sent home or destroyed. In case he elects to have the car sent home, the persons having the car in their possession shall make same safe for trainmen as provided for in Interstate Commerce Rules and shall place an M. C. B. Defect Card on car for all defects for which the delivering line is responsible.

S. SKIDMORE, Secretary.

H. BOUTET, President.

RESOLUTION OF EXECUTIVE COMMITTEE.

We, Members of the Executive Committee of the C. J. C. I. & C. F. Association of America, believe that the foregoing changes in the M. C. B. Rules would be beneficial to the railroads throughout the country for the following reasons:

There is no benefit gained by making the delivering line responsible for defects, for which the owners are responsible, if car is in interchange.

We believe that the previous idea to make the delivering line responsible was for the purpose of maintaining the equipment. We do not believe this is accomplished, but it only makes a vast amount of work in tracing and giving cards for defects, which are purely chargeable to the owners.

We are firmly of the opinion that if defects are chargeable to owners under one condition same should be chargeable to them under all conditions. We are also of the opinion that owners' defects do not reach far enough and believe that a great number of cards are now issued against delivering lines, which should be chargeable to car owners. As same are being treated in this way at nearly every large interchange point in the country and if the rule is good at this point it should be good at other points throughout the country.

Our object in putting delivering line defects in the front of the book was so that the interchange inspectors would not be compelled to learn the whole book of rules by heart. All that would be necessary for them to know was what was safe to go to his line, according to the instructions of his superiors and for what the delivering line was responsible. We believe that this would save a great deal of time and a vast amount of disputes and delays to freight.

In regard to the combination which we saw fit to recommend, that they be reduced, it is our positive knowledge that the matter of combination of defects is abused in a great measure, for example, a car is run for one or two years on its own road with two broken sills and is offered to some connection and accepted for two broken sills as owners defect. The line receiving the car will probably deliver same back with an additional sill broken, then they are made responsible for the whole combination. This is not only true of railroad cars, but private line cars, which are not repaired when they get home with one or two sills broken, but allowed to run until they get a combination; then the railroad is compelled to pay for same and we do not think this is the intent of the rule made.

In regard to the changes in Rules 125 and 126 we cannot but believe it would be of great saving for the railroads throughout the country not to send cars of this kind home. We do not believe it would make near as much work for any line to repair an occasional car at the expense of the owner as it is to do under the present rules and same could be done in one of their principal shops and it would not entail the amount of repairs that is being done at points where they are not prepared to do the work.

This would also prevent the hauling of worn out cars and dilapidated cars over the country, which is not only expensive but dangerous to the line hauling them.

It is very seldom that a line is able to get one of these cars without having to shop it several times at its different repair tracks along the line, whereas if this car had been rebuilt or thoroughly repaired before it became unserviceable it could have been immediately put into revenue service instead of having been hauled from one to three thousand miles over the country empty. The following home route card will show this is being done at the present time:

Intercolonial car No. 1854, which was at Cleveland, Ohio, left over the C. C. C. & St. L. to the Terminal R. R, St Louis, to Vandalia R R., to Penna. Co., to the P. R. R., to D. H. Co. R. R., to Rutland R. R., to Q. M. & S. R. R., to the owners. This is only one of the many cases that actually come under our notice.

H. BOUTET, President.
A. BERG, Vice-President
S SKIDMORE, Secretary and Treasurer.

Executive Board:
C. WAUGHOP.
F. R. TRAPNELL.
GEO. LYNCH.
J. O'DONNELL.

The expense and annoyance of painting will not recur every year or two if you use

Dixon's Silica-Graphite Paint

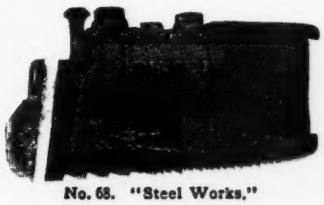
The pigments being inert set up no destructive chemical action within the paint coating itself--it dries by natural oxidation in a tough, elastic film. Durability records in all climates; write for a few.

JOSEPH DIXON CRUCIBLE CO.
JERSEY CITY, N. J.

ELLIS PATENT BUMPING POST

Noted for Simplicity, Strength and Lasting Qualities. Adapted to all positions.

Mechanical Mfg. Co.,
CHICAGO, ILL.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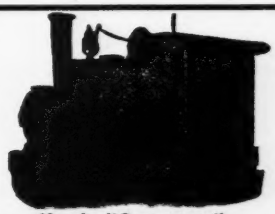
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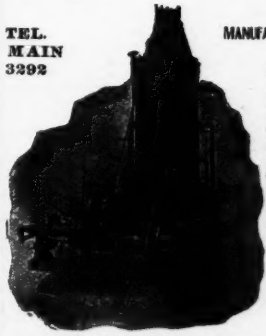

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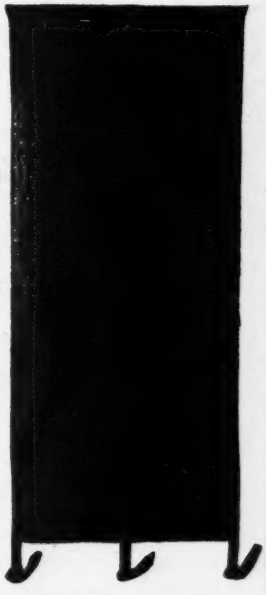

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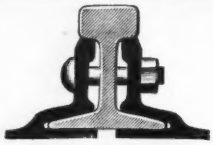

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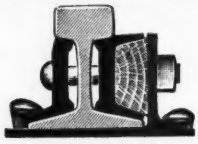

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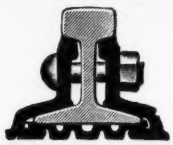

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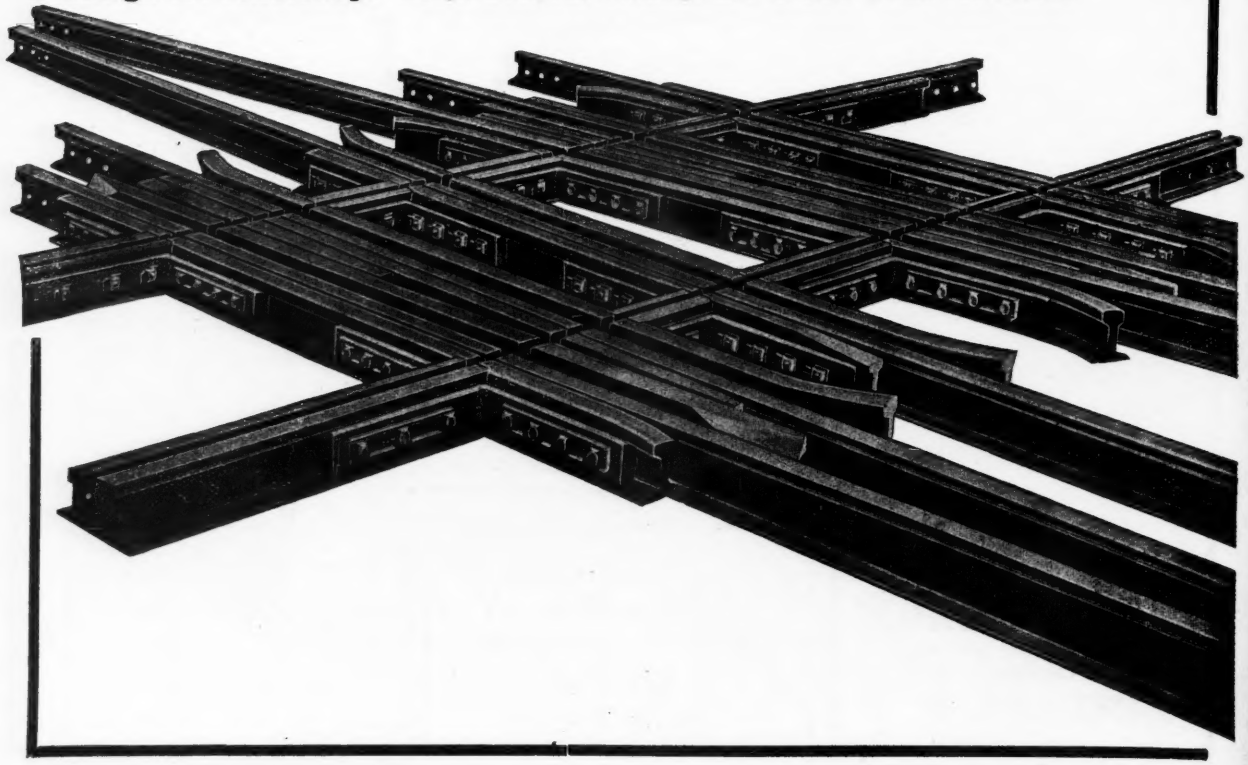

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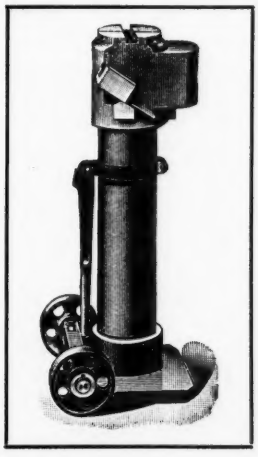

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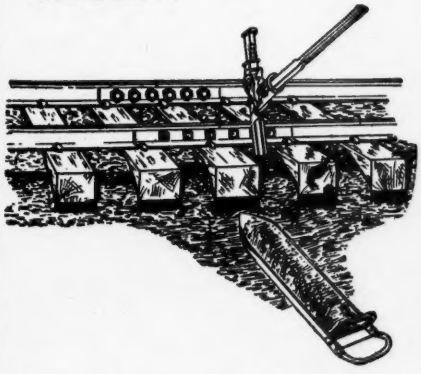

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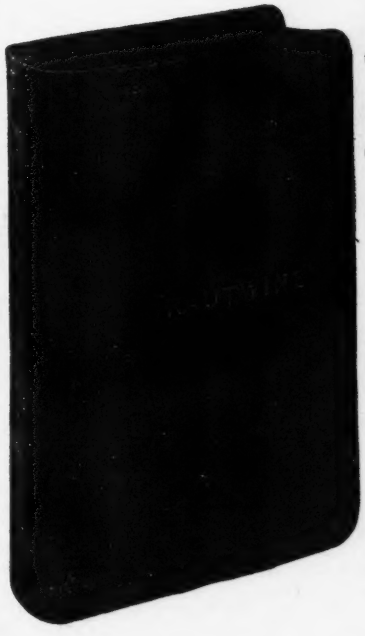

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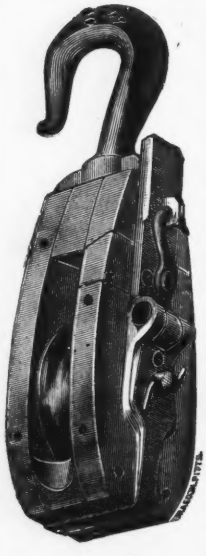

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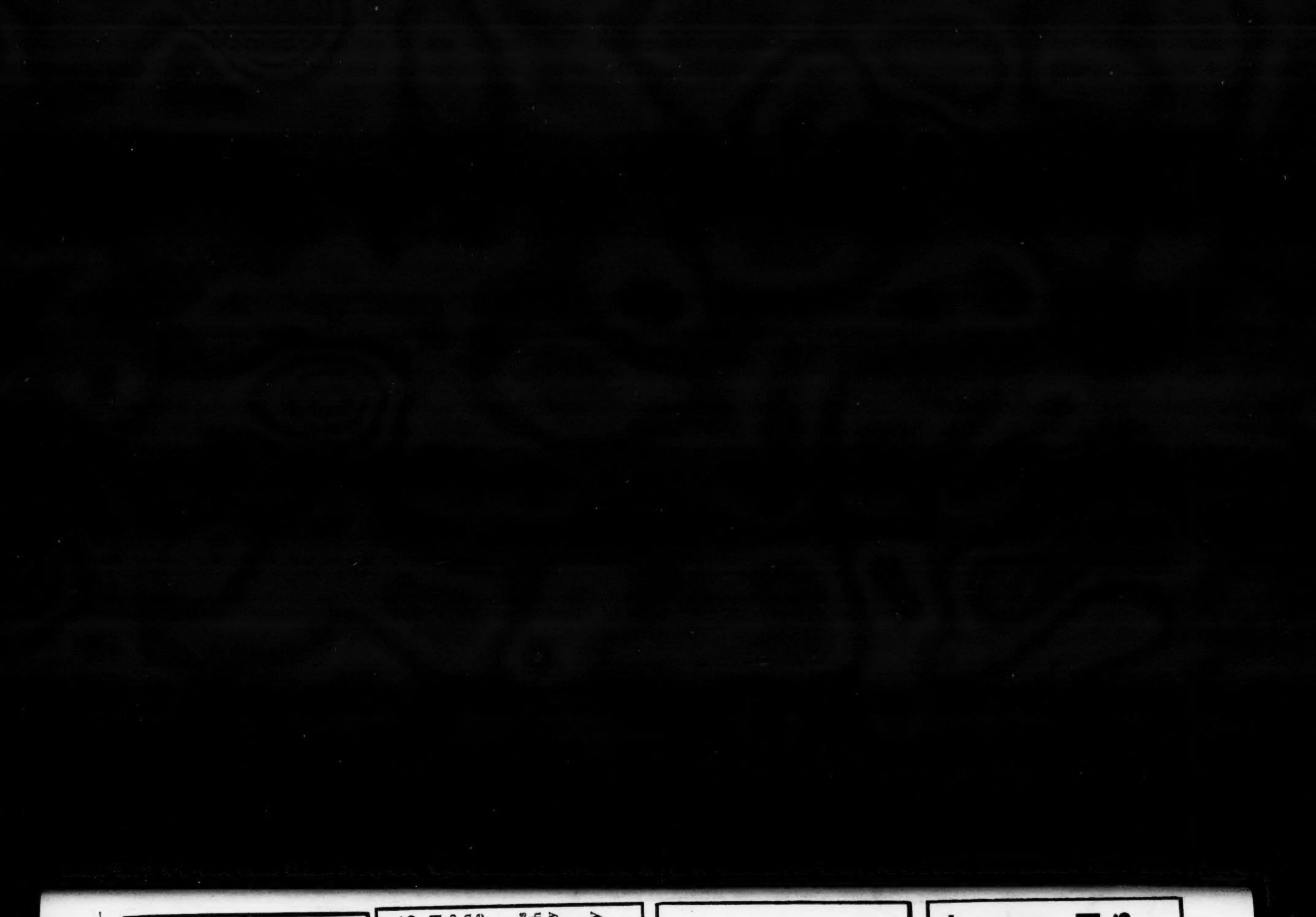
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